

Exhibit A

# THE UNIVERSITY *of* AKRON

## 1997-98 GRADUATE BULLETIN



THIS IS TO CERTIFY INFORMATION CONTAINED  
IN THIS PUBLICATION IS TRUE AND CORRECT  
IN CONTENT AND POLICY.  
SIGNED: *Benjamin Hill*  
TITLE: *Registrar* DATE: *4/27/98*



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# Calendar 1997-1998

## Fall Semester 1997

Day and Evening Classes Begin	Mon., Aug. 25
*Labor Day (Day and Evening)	Mon., Sept. 1
Veterans Day (classes held; staff holiday)	Tue., Nov. 11
**Thanksgiving Break	Thu.-Sat., Nov. 27-29
Classes Resume	Mon., Dec. 1
Final Instructional Day	Sat., Dec. 6
Final Examination Period	Mon.-Sat., Dec. 8-13
Commencement	Sat., Dec. 13
Spring Intersession	Fri.-Sat., Jan. 2-10, 1998

## Spring Semester 1998

Day and Evening Classes Begin	Mon., Jan. 12
*Martin Luther King Day	Mon., Jan. 19
*Presidents' Day	Tue., Feb. 17
Spring Break	Mon.-Sat., Mar. 16-21
***May Day	Fri., May 1
Final Instructional Day	Sat., May 2
Final Examination Period	Mon.-Sat., May 4-9
Commencement	Sat., May 9
Summer Intersession	Mon.-Fri., May 11-June 5
Commencement for Law School	Sun., May 17

## Summer Session I 1998

First 5- and 8-Week Sessions Begin	Mon., June 15
*Independence Day	Fri., July 3
First 5-Week Session Ends	Sat., July 18

## Summer Session II 1998

Second 5-Week Session Begins	Mon., July 20
8-Week Session Ends	Sat., Aug. 8
Second 5-Week Session Ends	Sat., Aug. 22
Summer Commencement	Sat., Aug. 22

## Fall Semester 1998

Day and Evening Classes Begin	Mon., Aug. 31
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The *Graduate Bulletin* is a supplement to The University of Akron *Undergraduate Bulletin*. The *Undergraduate Bulletin* contains information on undergraduate degree programs, non-degree continuing education programs, and additional information on the policies of The University of Akron.

For a copy of the *Undergraduate Bulletin* contact the Office of Admissions, The University of Akron, Akron, OH 44325-2001. (330) 972-7100, or toll-free, (800) 655-4884.

## Inquiries

Address inquiries concerning:

Graduate study to the Graduate School, The University of Akron, Akron, OH 44325-2101. (330) 972-7663.

Undergraduate admissions information, campus tours, and housing, to the Office of Admissions, The University of Akron, Akron, OH 44325-2001. (330) 972-7100 or toll-free, (800)655-4884.

Financial aid, scholarships, loans, and student employment to the Office of Student Financial Aid, The University of Akron, Akron, OH 44325-6211. (330) 972-7032.

Athletics to the Athletic Director, The University of Akron, Akron, OH 44325-5201. (330) 972-7080.

Registration, scheduling, residency requirements, and veteran's affairs to the Office of the Registrar, The University of Akron, Akron, OH 44325-6208. (330) 972-8300.

The University switchboard number is (330) 972-7111.

## University Closing Policy

The president, or designee, upon the recommendation of the associate vice president for the Division of Business and Finance will determine when conditions—such as severe weather or a state of emergency—necessitate closing the entire University or cancelling classes at the main campus and/or Wayne College in Orrville.

The associate vice president for administrative services will promptly notify other designated University officials and members of the Department of University Communications, who will contact area media. University colleges/departments/schools are encouraged to establish a method for communicating the closing decision to departmental personnel. Closing information will be announced as early and as simply as possible to avoid confusion.

Cancellation of classes and closure announcements will be made as early as possible in the day and will clearly state the affected campus(es). Call 972-SNOW or 972-6238 (TDD/Voice) for updated information.

While every effort is made to provide accurate and up-to-date information, the University reserves the right to change, without notice, statements in the *Bulletin* series which include, but are not limited to rules, policies, procedures, fees, curricula, courses, programs, activities, services, schedules, course availability, or other matters. For example, programs may be modified due to limited resources or facilities, unavailability of faculty, insufficient enrollment, or such other reasons as the University deems necessary.

\*Classes cancelled (day and evening)  
 \*\*Classes cancelled from Wednesday at 5 p.m. through Monday at 6:45 a.m.  
 \*\*\*Classes cancelled from noon to 5 p.m.

The University of Akron Graduate Bulletin  
 (USPS 620-400)

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August 1997

POSTMASTER

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 The Polsky Building, 467D, Akron, Ohio 44325-2101  
 Doli Q. Markovich, Coordinator of the Graduate School and editor of the *Graduate Bulletin*

# Important Phone Numbers

## University Area Code (330)

All phone numbers are subject to change without notice.  
For numbers not listed, call the University Switchboard (330) 972-7111.

## Graduate School

Admission, Graduate School	
Miss Brenda Henry	972-7665
Associate Dean, Graduate School	
Dr. Lathardus Goggins	972-6783
Coordinator, Graduate School	
Mrs. Dolli Markovich	972-6737
Dean, Graduate School	
Dr. Charles Dye	972-7664
Information, Graduate School	
Miss Heather Blake	972-7663
Graduate Degree Completion	
Mrs. Virginia Donnelly	972-5169
Graduate Minority Student Council	
President	972-5387
Graduate Student Financial Assistance/Secretary to the Dean	
Mrs. Karen Caldwell	972-6310
Graduate Student Government	
President	972-5387

## Colleges

Buchtel College of Arts and Sciences	972-7880
Community and Technical College	972-7220
College of Business Administration	972-7040
College of Education	972-7681
College of Engineering	972-7816
College of Fine and Applied Arts	972-7564
College of Nursing	972-7551
College of Polymer Science and Polymer Engineering	972-7500
The University of Akron—Wayne College	1-800-221-8308
NEOUCOM (Northeast Ohio Univ. College of Medicine)	325-2511
University College	972-7066

## Other Offices

Black Cultural Center	972-7030
<i>Buchtelite</i> , <i>The</i> (student newspaper)	972-7457
Center for Child Development	374-8761
Communication Centers (photocopying)	
Bierce Library	972-6278
Gardner Student Center	972-7870
Cooperative Education Programs	972-6722
Counseling, Testing, And Career Center	
Counseling	972-7082
Testing	972-7084
Career Services	972-6722
Coventry North, The University of Akron Center at	972-6266
English Language Institute	972-7544
Financial Aid, Office of Student	972-7032
Scholarships	972-7032
Work Study	972-7032
Gardner Student Center	972-7866
Health Services, Student	972-7808

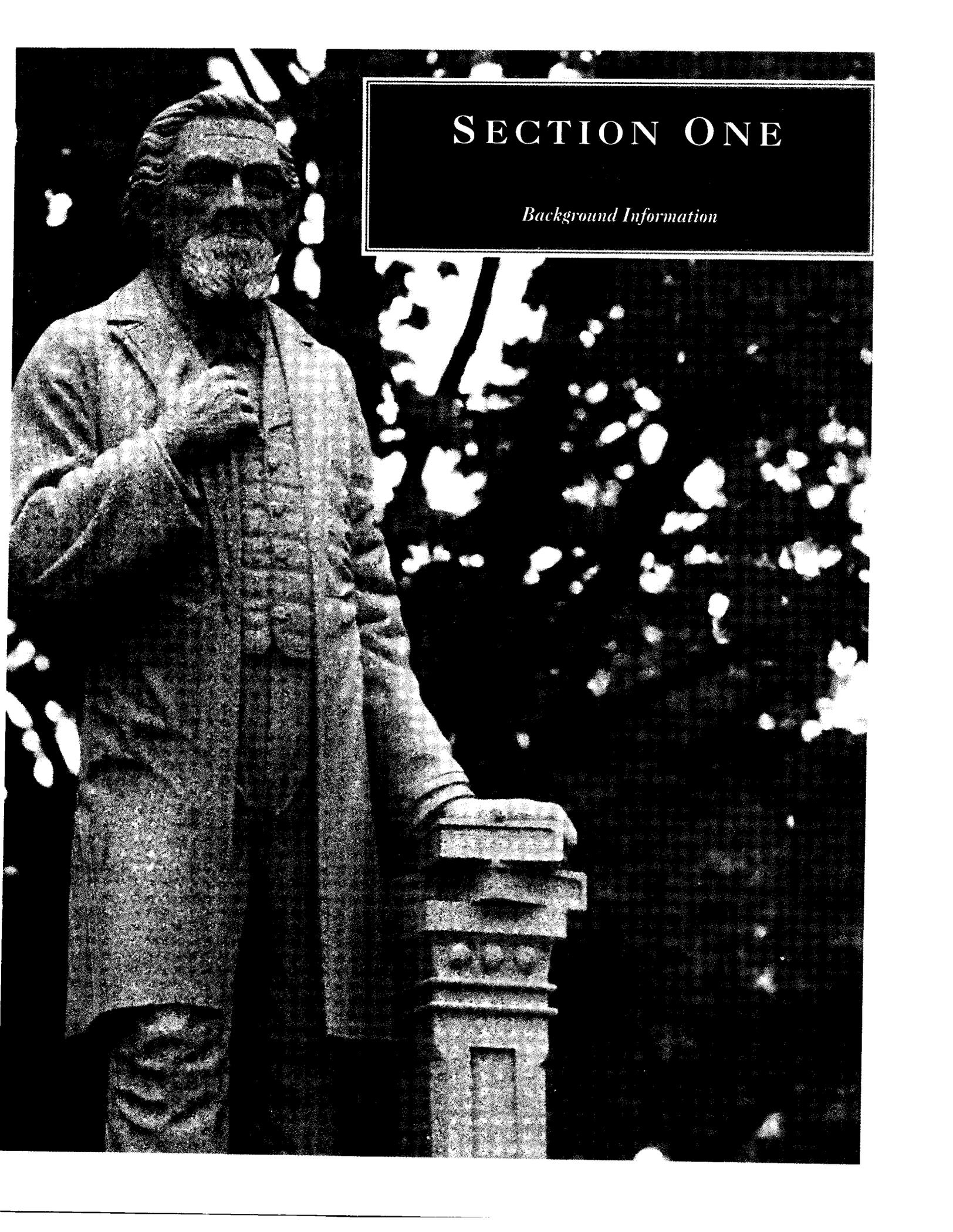
International Programs	972-6349
Immigration	972-6349
International Admission	972-6349
Minority Affairs, Office of	972-7658
Minority Retention	972-7314
Minority Student Support Services	972-6769
Libraries, University	
Bierce Library	972-7234
Law Library	972-7330
Science and Technology Library	972-7195
University Archives	972-7670
Parking Services	972-7213
Peer Counseling Program	972-8288
Placement Services	
Cooperative Education	972-6722
Placement Services	972-7747
Student Employment	972-7405
Student Volunteer Program	972-6841
Registrar, Office of the University	972-8300
Graduation Office	972-8300
Records and Transcripts	972-8300
Residence Life and Housing	972-7800
Services for Students with Disabilities	972-7928
TTY/TDD (hearing impaired)	972-5764
Sports Information, Director of	972-7468
Student Assistance Center	972-5755
C.A.R.E. Program (Chemical Abuse Resource Education)	972-5653
Study Abroad	972-6349
Ticketmaster	972-6684
University Program Board	972-7014
Veterans Affairs Coordinator and Counselor	972-7838
Work Study	972-7032
WZIP-FM Radio Station	972-7105

## Emergency Phone Numbers

Police/Fire/EMS	911
Police (non-emergency)	972-7123
Anonymous Crime Reports	972-TIPS (8477)
Campus Patrol	972-7263
University Switchboard	972-7111
Closing Information	972-SNOW (7669)

## Graduate School World Wide Web Location

Graduate School Homepage	<a href="http://www.uakron.edu/gradsch/">http://www.uakron.edu/gradsch/</a>
Graduate School E-mail	<a href="mailto:gradschool@uakron.edu">gradschool@uakron.edu</a>



# SECTION ONE

*Background Information*

# Background

## HISTORY

The connection between The University of Akron and its surrounding community has been a recurring theme from the institution's founding as a small denominational college in 1870 to its current standing as a major, metropolitan, state-assisted university. It is significant that the efforts, energy, and financial support of an Akron manufacturer of farm equipment, John R. Buchtel, were instrumental in persuading the Ohio Universalist Convention to build its college on a hill overlooking the town that stretched along the Ohio Canal. The grateful trustees responded by naming the school Buchtel College. It is also significant that during its first four decades the struggling institution was repeatedly aided in its efforts to survive by various local entrepreneurs who pioneered and prospered in such industries as cereals, clay products, matches, and rubber. Buchtel College's emphasis on local rather than denominational interests became increasingly clear, and by 1913 those strong ties and the school's financial situation caused its trustees to transfer the institution and its assets to the city. For the next 50 years, the Municipal University of Akron received its principal support from city tax funds and swelled from an enrollment of 198 to nearly 10,000.

The growth of the college paralleled the remarkable expansion of the community itself. From 1910 to 1920 Akron was the fastest-growing city in the country, evolving from a thriving canal town of 70,000 to a major manufacturing center of 208,000, thanks in large part to a boom in local factories that bore names such as Goodyear, Firestone, Goodrich, and others. The age of the automobile—and the demand for inflatable rubber tires—changed the complexion of Akron forever.

Changes within the Municipal University's curriculum reflected the strong interrelationship of town and gown. In 1914 a College of Engineering began instruction, and other professional schools followed: Education (1921), Business Administration (1953), Law (1959), the Community and Technical College (1964), Fine and Applied Arts (1967), and Nursing (1967).

Considering the institution's location in the heart of a burgeoning rubber industry, it seemed only appropriate that the world's first courses in rubber chemistry would be offered at Buchtel College, in 1909. From those first classes in Professor Charles W. Knight's laboratory would evolve the world's first College of Polymer Science and Polymer Engineering (1988), now the largest academic polymer program in the world. In the 1930s and 1940s, with the establishment in Akron of the Guggenheim Airship Institute, UA scientists studied the structure and design of zeppelins. During World War II, University of Akron researchers helped fill a critical need in the U.S. war effort by contributing to the development of synthetic rubber. The University's polymer programs have produced some of the world's most able scientists and engineers, and today attract millions of dollars annually in research support, as well as top graduate students from around the world.

But research, innovation, and creativity actively take many forms at the University—in the sciences and in the arts and humanities. Today UA faculty study ways of matching workers with jobs to maximize performance; they develop new ways to synthesize fuel; they write and produce plays, pen poetry, choreograph dance works; they explore improved methods of tumor detection; they evaluate the quality of water in Northeast Ohio; they provide speech and hearing therapy to hundreds of clients; and they study political campaign financing and reform. UA's continuing and central commitment to the liberal arts is signified by the perpetuation of the institution's original name in the Buchtel College of Arts and Sciences.

And the University has maintained an openness to innovation in other ways. As early as the 1880s, Buchtel College was liberalizing its curriculum by allowing students to choose free electives within their courses of study. The University later adopted and developed the general education concept, which represents an attempt to prepare students for both their personal and their professional lives by providing a balance between courses that teach them how to make a living and courses that teach them about life as we know it in Western civilization. As early as 1914, nine University engineering students headed out into Akron factories, initiating one of the country's first engineering cooperative education programs. World War I-era students included the nation's first female students to co-op in a commercial job.

The University has a long tradition of serving the needs of part-time and full-time students through day and evening classes, and it attracts traditional-age students and adult students of all economic, social, and ethnic backgrounds. Committed to a diverse campus population, the University is at the forefront of all Ohio universities in recruiting and retaining minority students.

The University's first doctoral degree was, appropriately enough, awarded in polymer chemistry in 1959, but master's degrees were granted as early as 1882. Doctoral work has now expanded to programs leading to the highest academic degree in 13 fields of study. In 1963 the receipt of state tax monies made UA a state-assisted municipal university, and on July 1, 1967, The University of Akron officially became a state university. Today, more than 24,000 students from 35 states and 80 foreign countries are enrolled in its 10 degree-granting units. The University of Akron is among the 60 largest universities in the nation and boasts the third-largest principal campus enrollment of Ohio's state universities. The University offers a comprehensive academic package featuring select programs unsurpassed nationally and internationally. Alumni of the University number about

103,000 and include scientists, engineers, artists, lawyers, educators, nurses, writers, business people, and other professionals at work in every state and 84 foreign countries.

The 170-acre Akron campus, with 76 buildings, is within walking distance of downtown Akron and is located in a metropolitan area of 2.8 million people. The University's presence in Northeast Ohio provides numerous opportunities in recreation, major collegiate, amateur, and professional sports, concerts, cultural events, and commerce, all within easy driving distance and many accessible via public transportation. Located on campus, the Ohio Ballet, Emily Davis Art Gallery, University Orchestra, Opera/Musical Theatre, concerts, recitals, choral programs, Touring Arts Program, University Theatre, Repertory Dance Company, and professional artists performing at E.J. Thomas Performing Arts Hall contribute to the University's rich cultural environment. The University has achieved a position of prominence in a number of intercollegiate sports. Having joined the Mid-American Conference in 1991, the University participates on the NCAA Division I level in 17 sports.

For more than a century The University of Akron has been an active participant in Akron's renaissance of commercial and artistic endeavor, a leader in the metropolitan area's intellectual and professional advancement, a center for internationally lauded research efforts, a source of enrichment, education, and vitality for Northeast Ohio. Our history is a long and proud one—but at The University of Akron our eyes are on the future, for our students, our faculty and staff, our community, and our world.

## MISSION STATEMENT

The University of Akron, a publicly assisted urban institution, strives to develop enlightened members of society. It offers comprehensive programs of instruction from associate through doctoral levels; pursues a vigorous agenda of research in the arts, sciences and professions; and provides service to the community. The University pursues excellence in undergraduate and graduate education, and distinction in selected areas of graduate instruction, inquiry, and creative activity.

## STRATEGIC DIRECTIONS

The following strategic directions provide further definition of the University's mission and service as the bases upon which the colleges, departments, and service units of the University are establishing program objectives now and toward the 21st century.

### Strategic Direction I

Attract and retain a higher quality and more diverse student body.

### Strategic Direction II

Identify and eliminate barriers to a campus culture of service, and make every effort to improve the campus environment.

### Strategic Direction III

Increase student retention and progress toward completion of their academic programs.

### Strategic Direction IV

Improve the quality of the undergraduate experience.

### Strategic Direction V

Cultivate scholarly and creative activities that are recognized regionally, nationally, and internationally.

### Strategic Direction VI

Acquire and efficiently utilize the human, informational, financial, and physical campus resources needed to fulfill the mission of The University of Akron.

## A CIVIL CLIMATE FOR LEARNING: Statement of Expectations

The University of Akron is an educational community of diverse peoples, processes, and programs. While all of us have our individual backgrounds, outlooks, values, and styles, we all share certain principles of personal responsibility, mutual respect, and common decency. Our campus culture requires that we maintain and extend those principles, for without them we cannot thrive as a humane and worthwhile university. To keep ourselves aware of these shared principles, this statement articulates some of the expectations and responsibilities of a civil climate for learning on our campus.

### Principles of Our Campus Culture

Our campus culture acknowledges the importance of all in our community for their participation in our common enterprise as a university. We value the contributions and we respect the needs of students, faculty, contract professionals, staff, administrators, maintenance and service personnel, and everyone else whose work and dedication enables us to pursue our individual and collective academic goals.

Together we maintain an **intellectual culture** that is accessible, disciplined, free, safe, and committed to excellence.

By our behavior with one another we endorse a **culture of diversity**, celebrating the uniqueness of the individual and developing our understanding and tolerance of differences in gender, ethnicity, age, spiritual belief, sexual orientation, and physical or mental potential.

We take responsibility for sustaining a **caring culture**, nurturing growth and fulfillment in one another and in the larger communities of which we are a part.

We insist on a **culture of civility**, united in our rejection of violence, coercion, deceit, or terrorism. We work to increase collaboration, cooperation, and consensus within rational dialogue characterized by mutual respect and consideration.

Ours is a **responsible culture**. We expect each member of our community to carry out responsibly his or her duties for preserving the integrity, quality, and decency of our environment and our discourse.

### Expectations and Responsibilities

To preserve and propagate the Culture of The University of Akron, everyone must engage in certain specific behaviors. Anyone new to this campus must be aware of the expectations we have of each other and be committed to fulfilling his/her responsibility in maintaining our culture.

#### Inside the Classroom

Inside the classroom, **faculty** are expected to respect the sanctity of the teaching/learning process by honoring their commitment to students in terms of time, fairness, and enthusiasm. It is the responsibility of faculty to set and enforce the classroom rules of conduct. Faculty members are expected to treat men and women, persons of all colors and ethnicities, and persons with varying abilities, spiritual preference, or sexual orientation with equitable respect and consideration. Faculty should value and pursue excellence in teaching as well as research. Faculty shall not engage in sexual or other forms of harassment or engage in inappropriate dual relationships with students. Faculty must not tolerate academic dishonesty nor discrimination or harassment from students to other students.

**Students** are expected to respect the sanctity of the teaching/learning process by expressing respect for the faculty member as the organizer and guide through this learning experience, as well as for fellow students. Disruptive, disrespectful, discriminatory, harassing, violent and/or threatening behavior is explicitly prohibited. Academic dishonesty will not be tolerated. Students are expected to take responsibility for their own learning and, in return, can expect responsible teaching from the faculty member. Students should report unprofessional behavior on the part of faculty members. Students have a right to expect that they will not be sexually otherwise harassed, intimidated, or threatened.

#### On the Campus

On the campus, everyone is expected to respect and protect the dignity and freedom of each other. There must be the opportunity for expression of all points of view, free from name-calling or ridicule. All members of the University family are expected to be civil and tolerant of others. It is the responsibility of each member of the University community to express dissatisfaction with anyone who fails to meet the responsibility of civility and to request that they do so. In the event that cooperation can not be attained, proper authorities must be involved to insist upon these minimum expectations. Only by campus-wide compliance to these expectations can we achieve a clear sense of our campus culture and, accordingly, a sense of mutual pride.

Students can expect that all representatives of all departmental and administrative offices will treat them with respect, a sense of cooperation and with concern for their welfare. Students can also expect appropriate coordination of services among departments.

Everyone is expected to respect the campus environment by behaving in ways that protect the safety, order, and appearance of all campus facilities. Each person must take steps to preserve the ecological and aesthetic aspects of the campus.

### Additional Behavioral Expectations

All members of the University community are required to abide by all laws and regulations of The University of Akron, the City of Akron, the State of Ohio, and the Federal Government. Students are expected to abide by the Student Code of Conduct and the University Disciplinary Procedures. Faculty, contract professionals, administrators, and staff are expected to abide by all University regulations and procedures.

## ACCREDITATION

Accreditation assures that degrees are recognized and approved by select regional and national education associations, societies, and councils. The University of Akron has been approved by the North Central Association of Colleges and Schools since 1914 and was recently reaccredited at the highest level as a comprehensive doctoral degree-granting institution. This recognition illustrates the high academic standards maintained at the University and assures students taking preprofessional courses leading to advanced study in such fields as medicine, dentistry, law, and theology that they are receiving sound preparation for acceptance at other graduate and professional schools. Accreditation also provides the security of knowing that the University will honor most credits earned at a similarly accredited college or university. Degrees earned at the University are respected and sought after by prospective employers.

In addition to the recognized regional accreditations, special accreditation for particular programs has been awarded as follows:

*Accreditation Board for Engineering and Technology,  
Technology Accreditation Commission*

*Accreditation Board for Engineering and Technology,  
Engineering Accreditation Commission*

*American Assembly of Collegiate Schools of Business*

*American Association of Nurse Anesthetists*

*American Chemical Society*

*American Council on Social Work Education*

*American Dietetic Association*

*American Home Economics Association*

*American Medical Association*

*American Psychological Association*

*American Speech-Language-Hearing Association*

*Association of Collegiate Business Schools and Programs*

*Committee on Allied Health Education and Accreditation of American Medical Association*

*Council for the Accreditation of Counseling and Related Educational Programs (provisional)*

*Council for Professional Development of the American Home Economics Association*

*National Academy of Early Childhood Programs*

*National Accrediting Agency for Clinical Laboratory Sciences*

*National Association of Schools of Art and Design*

*National Association of Schools of Dance*

*National Association of Schools of Music*

*National Association of Schools of Public Affairs and Administration*

*National Council for Accreditation of Teacher Education*

*National League for Nursing*

*North Central Association of Colleges and Schools*

*Ohio Board of Nursing*

*Ohio State Department of Public Instruction*

The University also holds membership in the following educational organizations:

*American Association of Colleges for Teacher Education*

*American Association of Community and Junior Colleges*

*American Association of State Colleges and Universities*

*American Council on Education*

*American Society for Engineering Education*

*American Society for Training and Development*

*Association of American Law Schools*

*Council of Graduate Schools*

*Council of the North Carolina State Bar*

*Department of Baccalaureate and Higher Degree Programs (National League for Nursing)*

*League of Ohio Law Schools*

*Midwestern Association of Graduate Schools*

*National Association of Graduate Admission Professionals*

*National University Continuing Education Association*

*North American Association of Summer Sessions*

*Ohio College Association*

*Ohio Council on Continuing Higher Education*

*State of New York Court of Appeals*

The School of Law is accredited by:

*American Bar Association*

The American Association of University Women grants membership to women graduates with approved baccalaureate degrees from The University of Akron.

# The Campus

During recent years, the University campus has undergone many major changes. In 1951 the University's 13 acres encompassed only 10 buildings. Currently the Akron campus covers 170 acres and includes 76 buildings. Plans have been made to renovate and build additional academic, recreational, and parking facilities. The campus is illuminated at night and security personnel patrol the area hourly.

## LOCATION

The University is situated in a large metropolitan area. The campus, although centrally located within the city, features parklike pedestrian areas. Students have easy access to retail outlets, transportation, and churches. Akron is easily reached by automobile from major national east-west routes (Interstates 80, 90, 76, and the Ohio Turnpike) and north-south routes (Interstates 71 and 77), all of which link Akron to the surrounding states and regions. The University itself is located between East Market Street and East Exchange Street in the downtown area. For airline passengers, limousine service is available from the Cleveland Hopkins International Airport and the Akron-Canton Regional Airport, south of Akron.

## BUILDINGS

Many of the buildings on campus bear the names of prominent persons who are recognized for their contributions in administration, education, business, science, or University service. Major buildings include:

**Admissions Building.** Located at 381 Buchtel Common, the Office of Admissions assists students with applications, requirements, and procedures for undergraduate, postbaccalaureate, guest, transfer, auditing, or special student status.

**Akron Polymer Training Center.** The Akron Polymer Training Center is an instructional classroom and laboratory facility for Polymer Engineering and Engineering and Science Technology Polymer Science classes.

**Alumni Association Center.** This recently remodeled building, north of East Buchtel Avenue at Fir Hill, houses the Office of Alumni Relations.

**Auburn Science and Engineering Center.** Named for Dr. Norman P. Auburn, 10th president of the University, this complex is one of the largest academic buildings in the state. The center houses the College of Engineering, including the dean's office, the Engineering Co-op Office; Mechanical, Electrical, Chemical, and Civil Engineering; as well as the Department of Biology, the recently completed \$2 million biology research facility, and the science and engineering holdings of University Libraries.

**Ayer Hall.** Named for the first dean of the College of Engineering, Frederic E. Ayer, Ayer Hall provides classrooms and offices for the mathematics and physics departments.

**Ballet Center.** This center, located at 354 East Market Street, houses dance studios, a choreography laboratory, faculty offices, and offices for the School of Dance, the Ohio Ballet, and the Dance Institute.

**Bierce Library.** Named for General Lucius V. Bierce, an Akron mayor, lawyer, historian, state senator, philosopher, philanthropist, and soldier, the building opened in the spring of 1973. In addition to the book and periodicals collections, the facility houses audio-visual materials, maps, and microforms. University Libraries, including science and technology materials located in the Auburn Science and Engineering Center, have holdings of more than 2.8 million items.

**Buchtel Hall.** Originally built in 1870, this structure was destroyed by fire in 1899 and rebuilt in 1901 (Buchtel Hall II). The administrative center of campus, Buchtel Hall was completely restored in 1973 following a devastating fire in 1971. It is the University's link with its predecessor, Buchtel College. It provides office space for numerous administrative officials of the University.

**Buckingham Center.** This building houses a Cultural Diversity Center, which includes the Black Cultural Center, Peer Counseling Program, Diversity Council, and a repository of African-American history.

**Business Administration Building.** This \$9.1 million facility, located at 259 South Broadway, was completed in 1991. The structure consolidates office, classroom, and laboratory facilities for the dean of the College of Business Administration, the George W. Daverio School of Accountancy, and the departments of Finance, Marketing, and Management.

**Carroll Hall.** Adjacent to the Gardner Student Center, Carroll Hall houses classrooms, laboratories, and offices for the departments of Counseling and Special Education, Geography and Planning, Developmental Programs, and the academic computer testing facility, as well as the University's Network Services and the Electronic Systems operation.

**Center for Child Development.** This former Girl Scout regional headquarters building at 108 Fir Hill has been renovated to accommodate the University's Center for Child Development.

**Central Services Building.** At 185 S. Forge St., this building houses the adminis-

trative service departments of central stores, printing services, and mail room.

**Computer Center.** Purchased and renovated in 1981 for \$1.3 million, this building at 185 Carroll Street houses the University's Information Services offices, main computers, and workrooms, as well as student and faculty microcomputer labs and time-sharing terminals.

**Computer Store.** Just west of the Gardner Student Center, the Computer Store is operated by Information Services.

**Crouse Hall.** Crouse Hall houses the Department of Geology, the Center for Environmental Studies, classrooms, and some of the College of Education offices.

**E.J. Thomas Performing Arts Hall.** Named for Edwin J. Thomas, prominent industrialist and dedicated member of the University Board of Trustees from 1952 to 1975, this cultural center, which cost more than \$13.9 million, was formally opened in 1973. Designed to accommodate concerts, opera, ballet, and theater productions, the hall is a masterpiece in architecture, acoustics, and creative mechanisms. It stands at the corner of University Avenue and Hill Street.

**Firestone Conservatory.** On the first floor of Guzzetta Hall, this facility provides classrooms, practice rooms, and offices for music.

**Folk Hall.** This building, at 150 E. Exchange St., provides modern, well-equipped School of Art facilities. Studios are available for graphic arts, photography, drawing, painting, metalsmithing, ceramics, and computer design. The Emily Davis Art Gallery is also located in the facility.

**Gallucci Hall.** This building, at 200 East Exchange Street, formerly a Holiday Inn, is a co-ed residence hall and home to the Honors Program and honors students. It also provides office space for Academic Achievement Programs, and temporary quarters for the Hospitality Management Department and *Crystal Room* dining facility.

**Gardner Student Center.** This complex was named for Donfred H. Gardner, who was appointed dean of men in 1926, the University's first dean of students in 1937, the first dean of administration in 1955, and later, in 1959, was promoted to vice president. He retired in 1962. This facility, which serves as a unifying force in the life of the institution, houses nearly 80 percent of all nonacademic activities on campus. It provides bowling alleys, meeting rooms, lounges, student activity and publication offices and workrooms, a game and billiard room, a bookstore, bank facilities, the Gardner Theatre, a cafeteria, and other dining facilities.

**Mary E. Gladwin Hall.** Housing the College of Nursing and biology laboratories, this building was named in honor of distinguished alumna Mary E. Gladwin (1887), who rendered unparalleled service to the nation during World War I. The \$10 million complex opened in 1979 and includes the administrative offices of the College of Nursing, faculty offices, the Center for Nursing, a Learning Resources Center that includes patient care simulation areas, an audio-visual center, and a state-of-the-art computer learning center.

**Guzzetta Hall.** Complementing the E.J. Thomas Performing Arts Hall, this facility was constructed directly across Hill Street. The \$5.5 million structure, dedicated in October 1976, houses the Office of the Dean of the College of Fine and Applied Arts, laboratory space for the School of Communication, and departmental space for the schools of Theatre Arts and Music. In addition to providing more than 40 student practice rooms, the complex houses radio and television studios, WZIP-FM, a small experimental theater, and a 300-seat recital hall.

**James A. Rhodes Health and Physical Education Building (JAR).** This structure on Buchtel Common is connected to Memorial Hall by a pedestrian bridge over South Union Street and contains an intercollegiate basketball facility seating 7,000, an indoor jogging track, physical education laboratories, classrooms, the athletic director's office, the sports information office, athletic offices, and a ticket office.

**Howser House.** Located on Fir Hill, this 19th-century mansion has been designated a Historic Place by the National Park Service.

**Knight Chemical Laboratory.** This \$10 million complex is named in honor of Dr. Charles M. Knight, who taught the first courses in rubber chemistry at Buchtel College as early as 1909. Opened in 1979, the building houses the Department of Chemistry and features many innovative laboratories with the most sophisticated safety equipment, as well as classrooms and faculty and administrative offices.

**Kolbe Hall.** Named for the first president of the Municipal University of Akron, this building is being remodeled for the School of Communication, WZIP Radio, and a proposed distance learning facility. It also houses the University Theatre.

**Leigh Hall.** Named in honor of Warren W. Leigh, first dean of the College of Business Administration, this facility on Buchtel Common currently houses the John S. Knight Auditorium and interim space for School of Communication faculty (during the Kolbe Hall Construction Project).

**Paul E. Martin University Center.** Located at 105 Fir Hill, the Paul E. Martin University Center has changed from a private club serving dues-paying members to a University-operated restaurant and banquet center. The table service restaurant is open for lunch between 11:30 a.m. and 2 p.m. Business and departmental functions, banquets, receptions, and parties can be scheduled during the hours of 7:30 a.m. to noon. The office of the Department of Development is located on the upper floors of the building.

**McDowell Law Center.** Named for C. Blake McDowell, prominent local attorney, alumnus, and benefactor of the University, the center houses the School of Law. Opened in 1973 at a cost of \$2.5 million, it provides space for the law library, classrooms, moot courtroom, appellate-review office, seminar rooms, and faculty offices. A \$2.8 million addition provides library and support space, and a \$1.5 million second

expansion has linked McDowell Law Center to West Hall, providing additional administration office space. The law complex stands at the corner of University Avenue and Wolf Ledges Parkway.

**Memorial Hall.** Dedicated to the memory of Summit County men and women who died in World War II, this is the companion building to the JAR. It contains offices of the Department of Health and Physical Education, a main gymnasium, a gymnastics area, a combatives area, a motor learning lab, a human performance lab, an athletic training lab for sports medicine, a weight training and fitness center, an athletics batting cage, the intramurals sports office, and classrooms.

**North Hall.** Located on South Forge Street, this building houses, on a temporary basis, supplemental service space for the campus police department.

**Ocasek Natatorium.** The \$6 million natatorium, completed in 1988, is a 70,000-square-foot structure that houses an Olympic-size swimming pool with adjacent spectator seating area, and locker rooms and showers. The center also houses nine racquetball courts as well as weight room facilities. The natatorium is named for former Ohio State Senator Oliver Ocasek.

**Olin Hall.** Named in honor of Professor Oscar E. Olin and Mr. Charles Olin, this facility was completed in May 1975. The hall houses the Office of the Dean of the Buchtel College of Arts and Sciences and the following departments and institutes: Classics, Economics, English, General Studies, History, Modern Languages, Political Science, Philosophy, Sociology, the Ray C. Bliss Institute of Applied Politics, and the English Language Institute. The complex is at the corner of Buchtel Common and South Union Street.

**100 Lincoln Street Building.** This building houses the Purchasing Department and Network Services, and Telecommunications Department offices, as well as the office of the University Architect and Senior Director of Facilities Planning, and the Office of the Director of Space Utilization.

**143 Union Street Building.** This building provides temporary administrative office space for the University treasurer, budget director, the payroll department, and Information Services' network services group.

**Olson Research Center.** This remodeled warehouse on Forge Street houses the Department and Institute of Biomedical Engineering and the Department and Institute of Polymer Engineering.

**Physical Facilities Operations Center.** This building, located at 146 Hill Street, houses physical facilities offices, craft shops, the central heating and cooling distribution center, and the Campus Police/Security Department.

**The Polsky Building.** The largest academic building in Ohio, this renovated downtown department store is home to the Graduate School, University Archives, the Archives of the History of American Psychology, the School of Speech-Language Pathology and Audiology and its Audiology and Speech Center, the Department of Public Administration and Urban Studies, the Center for Urban Studies, the School of Social Work, the University of Akron Service Consortium office, the Office of International Programs, the Department of Research Services and Sponsored Programs, and the Institute for Policy Studies. Also located here are the Community and Technical College dean's office, and the departments of Business Technology, Public Service Technology, Allied Health Technology, and Associate Studies. A fast-food service facility and a campus bookstore are in operation on the High Street level (third floor).

**Polymer Science Building.** Construction of the \$17 million Polymer Science Building was completed in the spring of 1991. This two-tower structure of steel, concrete, and glass, located at 170 University Avenue, houses offices for the dean of the College of Polymer Science and Polymer Engineering, and the Rubber Division of the American Chemical Society. The facility features a 200-seat lecture hall, offices, classrooms, and research laboratories for the Institute and Department of Polymer Science.

**Robertson Dining Hall.** This building at 248 East Buchtel Avenue has a cafeteria and dining room for students, as well as the campus infirmary, which provides health services for the University.

**Rubber Bowl.** This off-campus stadium at 800 George Washington Boulevard, four miles from campus, features an artificial turf playing field, seating for 35,000, locker rooms, concessions, and a press box.

**Schrank Hall.** Named for Harry P. Schrank, longtime member and chairman of UA's Board of Trustees, this complex, which adjoins Auburn Science and Engineering Center, is composed of two academic structures and a parking deck. Schrank Hall North contains the office of the president of the Faculty Senate, Civil Engineering offices, The Construction Technology program, and classroom space. Schrank Hall South provides facilities for the School of Home Economics and Family Ecology, the Community and Technical College's Engineering and Science Technology Division, and the Army and Air Force ROTC.

**Simmons Hall.** Named for Hezleton Simmons, University president from 1933 to 1951, this hall houses the University Counseling and Testing Center and the Department of Psychology. The Institute for Life-Span Development and Gerontology occupies a portion of the building. A student interested in employment counseling and assistance will find the Placement Services office in this facility.

**Spicer Hall.** This major student services building houses the Registrar's Office, Academic Advisement Center, the Office of Student Financial Aid, University College, the Office of Services for Students with Disabilities, and the Student Assistance Center, as well as the Parking Systems office, and offices for the University Controller, the University Auditor and External Auditor, the Cashier's Office, the Loans, Receivables Office.

**277 Broadway Street Building.** This building provides administrative space for the Office of Human Resources, including benefits, employment services, labor and employee relations, and personnel services, as well as the Department of University Communications.

**West Hall.** This renovated structure on Wolf Ledges Parkway is part of the McDowell Law Center.

**Whitby Hall.** Named for G. Stafford Whitby, a pioneer in the development of polymer science, this building opened in 1975. Housed in this facility are some polymer science laboratories and the Department of Chemical Engineering.

**Zook Hall.** Named to honor George F. Zook, president of the University from 1925 to 1933, this Buchtel Common facility houses the College of Education and provides a lecture room that seats 245, general classrooms, a handicrafts room, a teaching demonstration classroom, a microteaching laboratory, educational media lab, and the Student Teaching Office.

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## FACILITIES AND EQUIPMENT

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The University's addition of modern teaching aids demonstrates its recognition of the need, in this technological age, for up-to-date facilities and equipment. Many of these facilities are described below.

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### Buchtel College of Arts and Sciences

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The **Department of Biology** houses greenhouses, controlled-environment chambers, a new animal research facility, a molecular biology research center, modern laboratories, and equipment that includes advanced light microscopes (differential interference contrast, fluorescence), electron microscopes (scanning and transmission), scintillation counters, ultracentrifuges, DNA sequencing apparatus, and physiographs; vehicles and boats are available for fieldwork.

The **Department of Chemistry** is located in Knight Chemical Laboratories. The department offers outstanding instrumentation, such as nuclear magnetic resonance spectrometers, research-grade gas chromatographs, infrared and ultraviolet spectrophotometers, and other modern research tools for identification and characterization of compounds. The Chemical Stores facility maintains an inventory of more than 1,100 items, including chemicals, glassware, and apparatus.

The **Department of Economics** is housed on the second floor of Olin Hall in a modern office facility with space for faculty and graduate assistants. The Emile Grunberg Memorial Reading Room offers an intimate setting for one-on-one counseling for faculty and students as well as offering the collection of the past great distinguished professor. Computing is very important to the study of economics. Students of economics have a shared computer facility containing 10 Gateway 2000 machines running both DOS and Windows as well as a private computer lab within the department. A variety of software programs including economic tutorials, WordPerfect, SAS/MVS, SAS/VM and SAS/PC as well as laser printing services are available. Network access allows students to search for books on Ohio Link, submit jobs remotely to the University mainframe, or search the world via Internet for the latest economic information. The department maintains an active Gopher and World Wide Web access to economic resources worldwide. The proximity of the labs to the faculty encourages the type of interaction that will enhance students' learning.

The **Department of English** maintains a Communication Center, where English students may create and print papers, do desktop publishing, and gain telecommunication access through the ZIPnet and Internet. A department faculty member edits the *Faulkner Journal*. The Thackberry Room, located in the department, is a reference library for faculty and graduate students. It holds bibliographies, indexes, and reference works relevant to all specialties taught in the department. Graduate seminars are held in the department's own seminar room near faculty offices.

The **Department of Geography and Planning** houses laboratories for cartographic/GIS instruction, research and production. Equipment consists of computers and peripheral devices for digitizing, scanning, printing and plotting. A darkroom with a process film camera continues to be maintained. The department also houses a varied research collection of maps, aerial photos and periodicals.

The **Department of Geology** has modern instrumentation for field and laboratory studies which includes an automated electron microprobe, automated X-ray diffraction system, ion-coupled plasma spectrometer, atomic absorption spectrometer, ion chromatograph, coal and sulfur analyzers, oxygen bomb calorimeter, gravimeter, resistivity gear, refraction seismography, magnetometers, image analyzer, cathodoluminescope, microcomputer laboratory with printers, map and video digitizers, wide carriage network plotter, flat bed and slide scanner, core laboratory, research microscopes, a well-equipped darkroom, rock saws, automated thin-section equipment, portable rock corer, Giddings soil probe, a four-wheel-drive vehicle, and two 15-passenger vans.

The **Department of History** in Olin Hall is housed in a modern office suite with space for graduate assistants as well as professors. The Clara G. Roe Seminar Room is used for graduate seminars.

The **Department of Mathematical Sciences** is located on the upper floors of Ayer Hall. Students of mathematics, statistics, and computer science have access to a wide variety of computing facilities, operating environments, languages, and software in laboratories maintained in and by the department.

Two labs, which contain Intel-based computers, are connected by a Banyan VINES network. One of these labs is frequently used for class laboratory sessions for up to twenty students. This is a standard feature of many entry-level courses in mathematics and computer science. The other lab is an open lab in which students find a similar environment in which to work independently on assignments. The PCs themselves have a Windows 95 environment. NSF TCP/IP has been installed and access is provided to the Internet via ftp, telnet, MOSAIC, and Netscape. Software available includes Maple, ISETL, and MATLAB for mathematics; Turbo C++, Visual C++, Macro Assembler, Visual BASIC and Turbo Pascal for computer science; and Word Perfect, Microsoft Office, and Microsoft Works for more general use.

Another open laboratory is mainly devoted to a UNIX client/server environment. There are ten SUN SparcStations (Solaris 2.3/Openwindows) which support eight X-terminals. These devices are used for many of the upper-level computer science courses. They are on a separate local ethernet network supported by a SUN Sparc-server 20. They also support MOSAIC and Netscape. Languages available include Lisp, FORTRAN, Pascal, two versions of C and C++, and Perl.

The campus has a backbone network to which each of the local area networks is connected. Also on the backbone are a DecStation 5000 running ULTRIX, an IBM 4381, Model T-92, running VM/ESA, and an IBM 9672, Model R-41, running MVS/ESA. All of these machines are available from the department via the local area networks and also via dumb terminals located in parts of the two open computer labs. Access to SAS and SPSS for statistical processing, to Model 204, SQL/DS and DB/2 for database applications, and to a variety of programming languages, editors, and network services is provided to students and faculty by these machines.

Two undergraduate statistical laboratories are also supported by the department. Minitab is available in these laboratories on either Macintosh or Intel-based computers. These laboratories are used for statistics courses. Plans for the future include networking these labs.

Three special graduate/research laboratories are also part of the Mathematical Sciences Department. An Applied Mathematics and Scientific Computation Lab contains SUN SparcStations, IBM RISC 6000s, and Silicon Graphics Workstations. A MasPar parallel computer is provided for parallel processing. It is available for research, but is also used for an undergraduate computer science course. A lab is also available for graduate students in computer science. It has a variety of workstations and PCs and is connected to both the Banyan VINES network and the SUN network. The Center for Statistical Consulting provides graduate statistics students with a work experience in which they assist others in the solution of a wide variety of statistical problems. The Center is equipped with a Macintosh computer with Minitab, JMP, and SYSTAT statistical software, as well as a connection to VM for access to SAS and SPSS mainframe computing.

The campus is on both BITNET and the Internet. E-mail is available campus-wide. Most machines in the department also provide Internet access to encourage students and faculty to keep current on subjects of interest. The University and the department have home pages on the web. Additional information about the department, its faculty, and its programs, is therefore available on the Internet. The address for the home page of the department is <http://www.uakron.edu/math-sci.html>. Various web browsers are used (as indicated above). Remote log-ins from the University are permitted to those who have accounts elsewhere. For example, many faculty members have accounts on the Cray super computer in Columbus, OH.

Dial-in access to all facilities, except the Banyan network, is available. Students are encouraged to work at the location that is most convenient to them. Any communication software using kermit protocols can be used. Recently, ppp access was added.

With the variety of equipment, operating systems, languages and software, the Department of Mathematical Sciences can meet the computing needs of its students and faculty. As advances and changes are made in what is available, the department makes the appropriate modifications, updates, and purchases to maintain currency in a rapidly changing field.

The proximity of the faculty offices to the computer laboratories encourages regular interaction between students and faculty. E-mail is another vehicle for student-faculty communication. Staff members provide introductory seminars and are always available to assist and guide students. A friendly, informal, helpful atmosphere makes the Department of Mathematical Sciences an enjoyable place to learn and gain practical experience.

A most important resource of the **Department of Modern Languages** is the Language Resource Center in Olin Hall. The Language Resource Center contains facilities for students to listen to audiotapes and view videotapes as a class or individually. Fourteen networked multimedia computers have software for additional language practice and foreign language word processing. Access to the World Wide Web provides students with the opportunity to both read and listen to up-to-date news and cultural information in foreign languages. Magazines and dictionaries are also available for student use.

The **Department of Physics** is located on the first three floors of Ayer Hall. Facilities include research laboratories used for faculty and student research projects, laboratories for experiments associated with coursework and several microcomputer labs for undergraduate and graduate student use. Most of the department's computers are networked. The department has an e-mail system and a web page

(<http://www.physics.uakron.edu>) for use by the faculty and physics students. Many instructors use this system to distribute course materials and entertain questions and feedback from students. The smallness of the department provides ample opportunity for interaction with all faculty members. This interaction combined with the laboratory space, computing facilities and reading room offer a diverse learning experience to the student in an attractive and hospitable environment.

The **Department of Political Science** maintains an instructional computer laboratory consisting of eight computers and a scanner. This laboratory is used by Political Science students assigned research tasks requiring improved computer and Internet skills.

The Institute for Policy Studies supervises a computer-assisted telephone interviewing laboratory available to the campus research community. The laboratory consists of 24 IBM PS/2 microcomputers connected via a network to a variety of system servers. Each interviewer station is acoustically insulated from other stations and has specialized telephone and automatic dialing equipment. The survey facility is used for grant and contract research covering national, state, and local studies. When not required for survey projects, the computer network is used for a variety of classroom exercises and student research projects. Another 25 stations are available for faculty and graduate student support.

The **Department of Psychology** owns over 50 microcomputers that are available to faculty and students. Also available are research areas for the study of small-group behavior, and a psychology clinic complete with videotape capabilities for the study of counseling processes and outcomes. Two dedicated research labs contain Gateway 2000 386 and Pentium PCs. A word processing lab contains IBM compatible computers and HP LaserJet printers. A mainframe access lab for exclusive use by the psychology department has connections to the mainframe via PCs and terminals. Supported are major statistical packages—SAS, SPSS, and LISREL—which are accessed through VM-CMS. PC versions of SAS, SPSS, and LISREL are also available. Portable computers are available for field research. A full-time research programmer/analyst provides the hardware and software support for the department and writes custom software for computerized experimental control, stimulus display, and data collection. WordPerfect for word processing and Lotus Freelance Graphics for chart and graphic production are used throughout the department.

The **Department of Sociology** facilities include research laboratories used for funded research projects and a complete microcomputer laboratory for all graduate students. The department shares a computer facility for all students in Olin Hall which includes microcomputers and terminals directly linked to the University's mainframe computer. The anthropology laboratories contain hominid fossil casts, archaeological collections, and a variety of equipment used in archaeological field research projects.

## College of Business Administration

The **College of Business Administration** is located in the 81,000 square-foot, four-story College of Business Administration Building, which houses the college's offices, classrooms, computer laboratories, and advising services. The departments of Finance, Management, Marketing, the George W. Daverio School of Accountancy, the Fitzgerald Institute of Entrepreneurial Studies, the Fisher Institute for Professional Selling and the Institute for Global Business share the CBA. All undergraduate and graduate programs are fully accredited by the American Assembly of Collegiate School of Business, the most prestigious accrediting agency for business schools.

Tiered, amphitheater-style classrooms permit close contact between students and professors. The Milton and Henrietta Kushkin Computer Laboratory provides three computer classrooms, each equipped with nearly 40 personal computers and a homework laboratory for students with over 70 computers. Each PC is equipped with current versions of word processors, spreadsheets, database managers, and multi-media software. Also, all PC's are connected to the Internet, World Wide Web, and e-mail.

The nationally acclaimed Carl V. and Clyde A. Fisher Sales Laboratory provide the college with five small group lab rooms connected by one-way mirrors to a central monitoring and control room. Sophisticated videotape equipment permits the recording of activities in each lab room which can then be shown to students to provide immediate feedback. This facility is a key resource in college programs for training in sales, sales management, negotiation, leadership, and employment interview preparation.

The Goodyear Tire and Rubber Company Lecture Hall, the building's largest classroom, is equipped with a state-of-the-art audio-visual system capable of projecting textbook material, transparencies, slides, videotapes, computer screen images, and the like onto the room's 10-by-10 foot screen. Other classrooms also offer multi-media capabilities.

Facilities for seminars, continuing education programs, and student organization meetings are provided in the John P. Murphy Executive Room and adjacent small-group meeting room.

The CBA Satellite Office of Placement Services is located in a suite of eight offices on the second floor. The suite includes a reception area, resource library, and interview rooms. The Placement Center's dedicated staff of career counselors provides assistance in resume preparation, development of interviewing skills, job-search strategies, on-campus interviews, job referrals, and internship/cooperative education opportunities. The CBAs internship and cooperative education programs are among the most extensive on campus.

Offices of the college's eighteen active student organizations are located in the James Dunlap Student Organization Office Suite just off the atrium lobby. Student organizations offer opportunities for development of social, professional, leadership, and networking skills through interaction with business professionals and other students.

## College of Education

The offices, laboratories, and other facilities of the College of Education are located in Zook Hall, Carroll Hall, Crouse Hall, the James A. Rhodes Health and Physical Education Building, and Memorial Hall.

The **Department of Educational Foundations and Leadership** serves undergraduate and graduate students in the College of Education. The department serves undergraduate students by providing instruction in core courses in teacher education. In the area of leadership, the department provides graduate courses in school administration and higher education administration. The department members also teach the core curriculum of historical, philosophic, psychological, and social foundations required in all graduate education programs. They teach, advise, and supervise problems, theses, and dissertations of students in their degree-granting graduate programs, the master's programs in Educational Foundations, the master's and doctoral programs in Educational Administration, and the master's and doctoral programs in Higher Education.

The **Department of Physical and Health Education** prepares students for careers in teaching, athletic training for sports medicine, health education, coaching, related recreational fields, and related health fields. There are laboratories for the study of exercise physiology, motor behavior, teaching skills (microteaching), and computer utilization in physical and health education. The department has access to the James A. Rhodes Health and Physical Education Building (classrooms, the main gym, an indoor running track, a multi-purpose room, and four teaching station areas), Memorial Hall (classrooms, as well as large and small gyms), Ocasek Natatorium (a classroom, a swimming pool, nine racquetball courts, and a weight room), and Lee Jackson Field (14 tennis courts, an outdoor running track, and two softball fields).

The **Department of Curricular and Instructional Studies** includes both the areas of secondary education and elementary education. Instruction in secondary education prepares students for teaching careers at the middle, junior, and senior high school levels in various academic and vocational subject fields. Initial teacher preparation programs are available at the undergraduate, postbaccalaureate, and master's degree levels. The department also offers the Technical Education degree, which prepares students for teaching/training and other personnel positions at the postsecondary level and for business and industry settings. Instruction in elementary education uses those strategies appropriate for the Pre K-8 child in the teaching-learning situation as the basis for its broad offering of courses in the disciplines of language literacy, mathematics, social studies, science, and art. Emphasis is given to higher-level thinking skills and the integrated curriculum. A mathematics lab and art lab facilitate the instruction of preservice teachers. The University Center for Child Development, directed by department faculty, provides day care for children while serving as an experiential learning site for teacher education students.

The **Department of Counseling and Special Education** incorporates three divisions: Counseling and School Psychology, both graduate programs, and Special Education, which prepares undergraduates as teachers for children with special needs and graduate students to be master teachers and supervisors of special education programs. The department operates a multidisciplinary clinic, the Clinic for Child Study and Family Therapy.

## College of Engineering

The **College of Engineering** provides educational opportunities for students at both the undergraduate and graduate levels who wish to pursue careers in engineering.

The College has undergraduate programs in Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, Computer Engineering, Engineering, and Mechanical Polymer Engineering. The programs in Chemical, Civil, Electrical, and Mechanical are currently accredited by the Accrediting Board for Engineering and Technology and accreditation for Computer Engineering and Mechanical Polymer Engineering is expected in 2002. The Mechanical Polymer Engineering program is jointly staffed by faculty from the Mechanical Engineering Department in the College of Engineering and the Polymer Engineering Department in the College of Polymer Science and Polymer Engineering.

The Construction Technology Program provides three years of study beyond the first two years in the Community and Technical College and offers a Bachelor of Construction Technology degree.

The College has one of the oldest and most successful Cooperative Education programs in engineering in the United States. Currently, over 80% of eligible undergraduates participate in the Cooperative Education program.

The College offers the Master of Science degree in Chemical, Civil, Electrical, and Mechanical Engineering; and the Master of Science in Engineering with

specializations in Biomedical Engineering, Polymer Engineering, and Engineering Management.

The Doctor of Philosophy degree in Engineering is offered in the interdisciplinary fields of Environmental Engineering, Mechanics, Systems Engineering, Materials Science, Transport Processes, Biomedical Engineering, and Polymer Engineering. There is a coordinated Doctor of Philosophy program in Engineering with Youngstown State University and a joint MD/Ph.D. program in Engineering with the Northeast Ohio Universities College of Medicine.

The College has a strong, active, and dedicated faculty. The College's undergraduate programs are visible and highly ranked. Graduates of these programs regularly achieve the highest scores in the State of Ohio on the Fundamentals of Engineering examination, the first step in professional licensure. Student teams that participate in national competitions consistently are in the top 10% of the competitors. The College maintains a centralized engineering computer and network services facility and a centralized machine shop that provides fabrication support for undergraduate and graduate projects. Several nationally visible research centers are currently active. These include the Computational Mechanics Research Center, the Process Research Center, the Institute for Biomedical Engineering Research, and the Microscale Physicochemical Engineering Center. The College enjoys excellent relations with industry and the public sector. The Engineering Advisory Council, with both industrial and public membership, works actively on behalf of the College.

The **Department of Biomedical Engineering** has nine major laboratories for instructional and research use. The biomechanics laboratory is equipped with materials testing equipment and finite element analysis capabilities. The image science laboratory has an instrumentation for production and analysis of various imaging devices. The image processing laboratory is built around Sparc workstations, two of which are equipped with image processing accelerators. Image processing and display software and a large database of medical images are available for students to use in individual research and class projects. The human interface laboratory conducts research in virtual reality, telemanipulation, biofeedback therapy, and minimally invasive surgery. The rehabilitation engineering laboratory is equipped to conduct collaborative research on problems related to stroke, head injury, and arthritic patients. The biomedical instrumentation laboratory has continuous wave and doppler ultrasonic equipment, surface temperature devices, and blood pressure and flow monitoring equipment. The biomedical modeling and control laboratory focuses on the interplay between modeling, system identification, control theory, physiology and neurobiology for physiological systems analysis and control. The laboratory has a variety of computer hardware and software and computer controlled IVAC volumetric infusion pumps. The vascular dynamics laboratory provides facilities to analyze blood flow using laser doppler anemometry and doppler ultrasound techniques. The motion analysis laboratory studies all aspects of human movement (body motion, joint forces and moments, and muscle activity). The laboratory is equipped with a Vicon Motion Analysis System, two AMTI force plates, a MA-100 EMG system, and associated computer hardware and software. The biostereometrics laboratory is equipped to perform spatial analysis using three-dimensional sensing technology, which includes a Kern-Maps-200 Digitizing System and a JK Laser Holographic camera for laser interferometry.

The **Department of Chemical Engineering** possesses a variety of modern research equipment. The Particle and Catalyst Characterization Laboratory has a Quantasorb surface area analyzer, a flow BET unit, a temperature programmed chemisorption and desorption unit, and a mercury intrusion porosimeter.

The Process Research and Development laboratories have nine micropilot plants for diverse chemical process applications, element analyzer, sulfur analyzer, automated chlorine analyzer, coulter particle counter, ash fusion analyzer, TGA/DSC, oxygen bomb calorimeter, Tilt-A-Mix reactor, FTIR, CDS Automated Micropilot Plant, ICP, and four fermenter systems.

The Chemical Reaction Engineering laboratories have 14 high pressure reactor systems that are currently being used for various chemical reaction studies, including oxygenated fuels, polymerization, coal liquefaction, supercritical reactions, etc. An in-situ IR-based reactor is controlled by an on-line computer and is very efficient for mechanism studies. A slurry-reactor, micropilot plant operates in a three-phase catalytic mode and is ideal for carrying out various fundamental and engineering studies on three-phase catalytic reactions. A gas chromatograph/mass spectrometer is available for product stream analysis.

The Applied Colloid and Surface Science Laboratory has a state-of-the-art laser light scattering facility including a Lexel argon-ion laser, a vibration isolated optical bench, a Brookhaven correlation and probability analyzer, and an IBM PC-based data acquisition system.

The focal point of the undergraduate laboratories is the Corning Glassplant 6-inch and 12-inch distillation unit, which includes a 12-plate bubble-cap column and an 8-foot high packed-bed column. The unit is 24 feet high. There is also a pilot plant with a 5-gallon agitated reactor and a packed-column stripping facility. The laboratories also include a fluid flow measurement experiment and heat transfer study systems.

The Department of Chemical Engineering has an undergraduate computer and ASPEN laboratory which also provides students self-study areas as well as excellent on-line computer access.

The **Department of Civil Engineering** has five major laboratories. In the environmental engineering laboratory, students learn to analyze water, wastewater and contaminated soils to assess its quality and to determine the most effective treatment techniques. Laboratory equipment includes UV-visible spectrophotometers, respirometers, gas chromatographs, high-performance liquid chromatographs, toxicity analyzers, and a total organic carbon analyzer. Water and wastewater analytical kits and specialized meters are also available for field studies.

The Wendell Ladue undergraduate computer room is equipped with personal computers and associated facilities for the use of civil engineering students for both class and personal use.

In the hydraulics laboratory a tilting flume enables the student to visualize water flow in streams and rivers. Models of bridges and dams can be studied; the wave tank enables a student to study the effect of waves on lake shore erosion, harbors, breakwaters, and off-shore structures; the mobile bed tank is used to demonstrate erosion and sediment deposition patterns around bridges, piers, and culvert and storm drain outlets.

In the soil mechanics and foundation engineering lab, a student learns how to analyze soil by a variety of tests and equipment to determine shear strength characteristics, compaction characteristics, and seismic and electrical resistivity equipment for geophysical exploration of soil and rock deposits.

In addition to the standard equipment for routine testing, the laboratory has a computer-controlled cyclic triaxial testing system, pneumatically loaded consolidometers, flexible wall permeameters, a portable static/dynamic cone penetrometer, a pile-driving analyzer, and capability for ground vibration monitoring and analysis.

In the structural materials laboratory the opportunity to observe experimental verifications of earlier training on the behavior of structural members subjected to tension, compression, bending, and torsion is accomplished with the use of three universal testing machines, an MTS closed-loop system which has a loading capacity to 100,000 pounds, and two Instron dynamic testing machines which can be used in either uniaxial or torsional loading.

The **Department of Electrical Engineering** maintains circuits, analog and digital electronics, control, computer, energy conversion, microprocessor interfacing, power electronics and electromagnetic/microwave laboratories. Laboratories follow instruction to help the student apply the material learned in class.

In the circuits laboratory students learn the basics of circuit design, instrumentation and measurements. The laboratory is equipped with digital oscilloscopes, digital volt/ampere meters and other basic measuring equipment.

The analog and digital electronics laboratory builds on the circuits sequence and introduces the student to more advanced design tools and concepts, including computer simulation of circuits. In addition to digital oscilloscopes, the laboratory contains signal generators and the like, specialized equipment such as a transistor curve tracer, single-board microcomputers, development systems, personal computers and other specialized instruments.

The computer laboratory is an open laboratory with free access to students. The laboratory contains networked personal computers with all software necessary for other courses, as well as word processing and networking software. The laboratory also serves courses in computer engineering and many elective courses and for research purposes.

The two control laboratories teach the basics of analog and digital control. The laboratories are equipped with digital measuring equipment, analog and digital computers and interfacing components.

The energy conversion laboratory teaches electric machine, energy conversion, and machine control. The laboratory is equipped with motors, generators and controllers, both digital and analog. Emphasis is placed on computer control of machines.

The microprocessor interfacing laboratory is dedicated to interfacing the computer to the outside world. Students learn how to connect devices to computers, how to program them, and how these can be used in design. The laboratory uses a variety of real-world designs and projects to keep students up to date on this important engineering activity. The equipment in the laboratory includes personal computers, single-board micro computers and industrial controllers in addition to measurement equipment and components.

The power electronics lab is taught as part of a power electronics course and teaches design of power components and circuits for operation at high voltage, high current and high power. Digital controllers and all digital measuring equipment account for a very modern laboratory.

The electromagnetics/microwave laboratory uses basic experiments in transmission lines, waveguides and antennae to teach the principles involved. In addition to the basic equipment, the laboratory has a shielded room for specialized measurements.

Additional laboratories in software engineering, signal processing and advanced control exist as part of elective courses.

The **Department of Mechanical Engineering** maintains laboratories in the Auburn Science and Engineering Center for undergraduate instruction and graduate instruction and research. These include:

Thermal and Fluid Science Laboratory with internal combustion engines, a supersonic wind tunnel, and a subsonic wind tunnel.

Heat Transfer Laboratory with thermal conductivity, radiation and temperature measurement systems, a gas laser and a spectrum of heat exchangers.

Mechanical Measurements Laboratory with a complete complement of transducers, calibration equipment and standards, signal conditioners, analog recording devices and microprocessor-based digital data acquisition systems.

Materials Testing Laboratory with computer controlled servohydraulic structural testing machine and a uniaxial universal testing machine for performing static, quasi-static, cyclic, and dynamic tests on a spectrum of engineering materials, and several types of hardness testing equipment.

Experimental Mechanics Laboratory with photoelastic strain measuring equipment and associated facilities, coupled with a complete range of strain gage instrumentation for both static and dynamic measurements.

Mechanical Design Laboratory with several major software packages for computer-aided design connected to the University's engineering computer graphics facility.

System Dynamics and Controls Laboratory composed of several microprocessors, analog computers, and digital control, as well as equipment for process control and robotics.

Vibration and Acoustics Laboratory with electromechanical shakers, sound pressure level instrumentation, and frequency spectrum analyzers for modal analysis.

Metallography and Failure Analysis Laboratory with a complete set of metallographic instrumentation for microstructural analysis of both conventional and advanced engineering materials, and electron microscopes for analysis of failure.

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## College of Fine and Applied Arts

The **School of Communication** features a television classroom/studio and a wide complement of supporting audio and video equipment, including graphics generators and linear and non-linear editors. Portable audio and video equipment is available for location use. There is an audio recording facility with multitrack capability. The School also houses radio station WZIP, an on-air 7500 watt FM radio station serving Northeast Ohio. WZIP-FM is operated by UA students under the supervision of professional broadcasters and gives students an opportunity to develop skills in broadcasting and communication through the completion of on-air assignments. A multimedia production/editing laboratory-classroom supports class instruction. News, publications, and other writing classes have access to a Macintosh computer laboratory with complete desktop publishing layout, graphics, and print capabilities. The School works in cooperation with local organizations, non-profit groups and professional agencies in an internship program for upper-level students.

The **School of Speech-Language Pathology and Audiology** provides preprofessional and professional training to students who wish to become speech-language pathologists and/or audiologists. The department houses the Audiology and Speech Center, which functions as a practicum training arm as well as a service agency for persons in the Akron community who have speech, language, or hearing problems.

The **School of Home Economics and Family Ecology** has food and nutrition laboratories, textile conservation and clothing laboratories, an interior design and drafting laboratory, and a multipurpose lecture/laboratory area. These specially equipped areas are designed for demonstration and study in the areas of home management, equipment, home computers, consumer education, housing, interiors, home furnishings, and community involvement. Additionally, the school maintains an executive conference room, and a graduate and teaching assistants' office. In cooperation with the College of Education, the school also operates and maintains a completely equipped nursery school facility for the study of child development and for teacher education.

The **School of Music** is housed in Guzzetta Hall and also utilizes the E.J. Thomas Performing Arts Hall. Guzzetta Recital Hall seats 250 and is equipped with a pipe organ, harpsichord, two concert grand pianos, and a recording booth. The Music Computer Center is equipped with Macintosh computers and MIDI/sound and video equipment. An electronic music studio features digital and analog multitrack recording and sound synthesis equipment for music composition. Classrooms, studios, and 40 practice rooms (acoustical sound modules) are used for teaching, rehearsals, and practice.

The **School of Social Work** offers CSWE-accredited professional training to social work students by linking them to a variety of local health and human services community agencies and organizations. The strong commitment and interaction with a network of agencies in the community serves as a laboratory for students.

The **School of Theatre Arts** uses three different performing spaces to present its annual season of two to four productions. Guzzetta Hall houses the versatile "black box" experimental Sandefur Theatre as well as rehearsal, teaching, and shop facilities. Kolbe Hall is the site of the 244-seat University Theatre, complete with support facilities. The conventional proscenium theatre is the home of theatre productions, as is the multipurpose E.J. Thomas Performing Arts Hall. Student productions are performed in Studio 28, Sandefur Theatre, and Kolbe Theatre.

## College of Nursing

The **College of Nursing**, housed in Mary Gladwin Hall, provides professional nursing education at the undergraduate and graduate levels. The college is approved by the Ohio Board of Nursing, and all programs are fully accredited by the National League for Nursing. The college has a Student Affairs Office which provides academic advising services to prospective students. The college houses a state-of-the-art Learning Resource Center, including a computer laboratory and the Center for Nursing, which is used by faculty and students for practice and research.

The undergraduate nursing curriculum is a six-semester clinical sequence after completion of University and college prerequisite courses. The undergraduate program offers the basic B.S.N. program and sequences for licensed practical nurses and registered nurses who wish to obtain the B.S.N. degree. The graduate program prepares nurses in the areas of education, administration, and/or advanced practice. Areas of specialization include child and adolescent health nursing, adult health nursing, liaison-community mental health nursing, gerontological nursing and nursing anesthesia. There is also a sequence within the graduate program for registered nurses from associate degree and diploma programs to obtain a master's degree.

Students at all levels have clinical experience in a variety of settings including hospitals, clinics, rehabilitation agencies, long-term care facilities, community health agencies, mental health agencies, pediatric agencies, and home care settings.

## College of Polymer Science and Polymer Engineering

The **College of Polymer Science and Polymer Engineering** offers only graduate degrees leading to the Master of Science and Doctor of Philosophy in both Polymer Science and Polymer Engineering. In addition, there are elective courses in both polymer science and polymer engineering for undergraduate science and engineering majors.

The facilities of the **Department of Polymer Science** and the **Maurice Morton Institute of Polymer Science** support fundamental and applied research in polymer chemistry, physics, and many aspects of polymer behavior. There are extensive laboratories for polymer synthetic chemistry and for the characterization of macromolecules and polymer morphology. The macromolecular modeling center provides state-of-the-art computer modeling capabilities for research, and provides a way to introduce chemistry students in local high schools to computer modeling. A nuclear magnetic resonance laboratory is maintained with several high-resolution instruments supervised by a professional staff. The applied research section of The Maurice Morton Institute of Polymer Science operates a variety of analytical and compounding/processing laboratories to serve the needs of industry and government agencies for a reliable source of problem solving and data. The total value of major instrumentation and equipment housed in the polymer science laboratories exceeds \$6 million.

The **Department of Polymer Engineering** and **Institute of Polymer Engineering** maintain a broad-based range of processing, structural, and rheological/mechanical characterization facilities. Processing facilities include unique blending/compounding facilities with five twin-screw extruders, a Buss kneader, and seven internal mixers including flow visualization capability; seven single-screw extrusion lines for plastics and rubber, with ultrasonic and sound waves and rotational mandrel dies, and with single/multiple bubble tubular film and cast film extrusion capability as well as a biaxial film stretcher. Molding facilities include screw injection molding capability of five machines, blow molding, plug assist thermoforming and compression molding with composites capability. The Institute of Polymer Engineering is the home of the EPIC-M.A. Hanna Compounding and Blending Center and the Molding Technology Center. Characterization capability includes scanning and transmission electron microscopy, X-ray diffraction (including a rotating anode X-ray generator), Fourier transform infrared, small angle light scattering, optical microscopy and retardation, radiography, differential scanning calorimetry, thermogravimetric analysis, dielectric thermal analysis, and surface profiling, rheological and mechanical testing, including elongational flow, rotational and capillary shear rheometry, dynamic mechanical, tensile and impact testing.

The **Akron Polymer Training Center**, which serves as a laboratory for the processing and testing of rubber and plastic materials, was opened in June 1994. The Center was developed at the urging of the Akron Regional Development Board and EPIC, an industrial-government-university consortium, to train machine operators and technicians for the polymer industry. The Center also provides classrooms and laboratories for graduate students in Polymer Engineering, for undergraduate students in Mechanical Polymer Engineering, and for two-year associate degree students in Polymer Technology as well as continuing education courses for scientists and engineers.

## University Libraries

Library facilities are housed in three separate locations: in Bierce Library on Buchtel Common; the Science Library in Auburn Science and Engineering Center, Room 104; and Archival Services in the Polsky Building, lower level.

Library services include reference and research assistance, user education, bibliographic instruction, and computer-based information searching. Materials can be borrowed from the University Libraries through the circulation department or obtained from other libraries through the OhioLINK network or other resource-sharing arrangements.

The University Libraries' collections contain more than 2.8 million items: books, periodicals, government documents, curricular materials, microforms, maps, audio-visual materials, and archival documents. The library receives nearly 5,000 magazines, journals, newspapers, and other serial publications, such as annual reports and the publications of various societies.

Through the library's memberships in the Center for Research Libraries, the Ohio Library and Information Network, the Northeast Ohio Major Academic and Research Libraries consortium, the Online Computer Library Center (OCLC), and the Ohio Network of American History Research Centers, access to vast resources is greatly increased for University students, faculty, and staff.

University identification cards function as library cards. Photocopy services and equipment for use in making paper copies from microforms are available in Bierce Library and in the Science Library. Group study rooms and typing facilities are also in Bierce Library.

Audiovisual Services, located in Bierce Library, Room 63B, maintains an extensive centralized collection of media hardware and audio-visual resources for student and faculty use. It also has a collection of instructional materials in various media formats (filmstrips, slides, etc.) to supplement class-room instruction. Its new Media Center supports faculty who want to improve teaching through the use of technology. Audio Visual Services also designs, installs, and maintains technology-enhanced general purpose classrooms, offering permanent in-room projection, sound reinforcement and a sophisticated media retrieval system.

## Information Services

The **Information Services Department** provides communications and computing support for The University of Akron. There are four divisions within the department:

- Client Services (Computer Center and Carroll Hall)
- Technical Services (Computer Center)
- Telecommunications Services (Lincoln Building)
- Applications Services (Computer Center)

The Information Services Help Desk can be reached at (330) 972-6888. Help Desk personnel can answer questions or refer callers to the appropriate source for more information. The walk-in consulting desk is located in the Computer Center, room 144, and can also be reached by E-mail at [consult@uakron.edu](mailto:consult@uakron.edu). Free seminars, handouts, and dial-in software are available.

There are six general purpose computer labs for students, faculty and staff to use. In addition, there are about 130 Windows/DOS computers and 10 Macintosh computers (Computer Center only) in these labs. These computers have personal productivity tools (such as word processing and spreadsheets) and network access. The lab locations are:

- Computer Center, rooms 139, 141 and 146
- Gallucci Hall, room 279
- Bierce Library, room 274A
- Polskys, room 267
- Olin Hall, room 273
- Mary Gladwin Hall, room 306

There are more than 300 dial-in lines for faculty, staff, and students to use with their computers and modems from home to access UA and internet networks.

UA's computer network, named UAnet, has about 4,000 computers connected on campus. To use these services, faculty, staff and students should go to the Computer Center at 185 Carroll Street and obtain a UAnet ID. The network provides access to:

- ZipLINK - UA's library catalog
- OhioLINK - the library catalogs of all State of Ohio universities and colleges.
- Electronic Mail (E-mail)
- The Internet: a world-wide network, including the popular World Wide Web (WWW) multimedia information protocol
- Usenet news groups
- Discussion lists
- Wayne College
- UA Center at Coventry North
- IBM mainframes and Digital servers

Student information is available using a touch-tone telephone and a PIN number. Services available in this manner include:

- Registration for classes
- Personal financial aid information
- Course grades
- Fee payment by credit card

Computer-Based Education and Testing services provide on-line tutorials, instruction, and testing for UA. The Testing Center is located in Carroll Hall, room 325.

Applications development and support for University systems is provided. Major systems supported include Human Resources, Student Information, Alumni and Financial Aid systems.

Central computer services include:

- A CMOS-based IBM 9672/R41 CMOS running MVS/ESA for administrative and batch research applications
- An IBM 4381/R14 running VM/ESA for interactive computer language support
- A Digital DECsystem 5000/240 for unix and c programming
- A Digital AlphaServer 1000 for E-mail and web home pages
- A Digital AlphaServer 2100 for ZipLINK, the on-line library catalog
- A Digital DEC 3000/300LX Usenet news server
- An IBM RS6000/390 for graphical, secure information access
- An NCS OpScan 21-75 optical mark sense reader for scanning mark sense forms

Other services provided to the campus by Information Services include:

- PC purchase information and assistance
- On-campus hardware and software installation services for departments
- Computer repair services (on-campus and carry-in)
- Cable Television - ZIP-TV
- Telephone and voice mail services
- Security systems
- Cable plant management
- Cable television and network connections to residence hall rooms in Grant, Garson, Gallucci, and the Townhouses
- Rental of public address systems for campus events

The Information Services Department continues in its quest to bring staff and students the most up-to-the-minute advances in computer applications, research, knowledge and training.

# Student Affairs

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## COUNSELING, TESTING, AND CAREER CENTER

The Counseling, Testing, and Career Center provides a wide range of psychological counseling, therapy, testing, career planning, and outreach and consulting services to the University community. The Center is staffed by psychologists and psychology trainees, and all services are confidential and free to enrolled students. The Center is located in 163 Simmons Hall, (330) 972-7082.

### Counseling Service

The Center's counseling service offers assistance in the following areas:

- Personal-emotional counseling deals, within a short-term framework, with feelings of loneliness, inadequacy, guilt, anxiety, and depression; harmful involvement with alcohol and drugs; recovery from acquaintance or stranger rape; interpersonal relationships, especially with the immediate family, intimate relationships, and roommates; personality development, identity, and self-esteem.
- Educational counseling relates to educational goals, motivation, attitudes, abilities, and the development of effective study habits and skills.
- Group educational programs through the College Survival Kit cover a wide range of topics which typically deal with improving grades, reducing test anxiety, planning careers, increasing wellness, and addressing personal issues; as well as providing support groups for minority students and others with a variety of concerns. Brochures are available.

### Testing Service

- A wide range of testing programs including college entrance examinations, career assessments, personality assessments, and some learning disability assessments are available to students.

### Career Service

- Career counseling involves discovering one's interests, needs, values, aptitudes, abilities, and goals; relating these to the world of work; exploring appropriate major subjects and career fields. Occupational information is available through reference books and two computerized career guidance and information systems, SIGI and OCIS.

## Outreach and Consulting Service

- The Center's outreach and consulting service offers assistance to the larger university community by providing programs and workshops for a wide variety of campus groups. The Center regularly provides speakers for classrooms, residence halls, student organizations, and administrative offices. Topics include, among others, academic performance, wellness, sexuality, and appreciating cultural diversity.

The Counseling, Testing and Career Center also cooperates with the Office of Placement Services in jointly providing an extensive range of career development services.

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## STUDENT HEALTH SERVICES

Health services are available to all students enrolled at The University of Akron. It is located in Robertson Dining Hall, immediately adjacent to the North Quad residence halls. This facility is capable of handling most acute injuries and illnesses. Student Health Services is open from 8:00 a.m. to 7:00 p.m., Monday through Thursday, and from 8:00 a.m. to 5:00 p.m. on Friday.

The student who becomes seriously ill or suffers a serious injury on campus should be taken to an emergency ward of one of the local hospitals without delay. Those persons present in this kind of emergency should call University Police or 911 immediately. The University assumes no legal responsibility or obligation for the expenses of such transportation or for medical services at the hospital.

Student Health and Accident Insurance, designed specifically for students, is required of all residence hall students and all international students except those who present proof of similar coverage. Other students may purchase this insurance at the annual individual rate. The student insurance provides coverage for such items as hospitalization, surgical benefits, and in-hospital medical benefits.

Completed health forms and other health-related records are treated as confidential and are kept in the Student Health Services offices.

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## SERVICES FOR STUDENTS WITH DISABILITIES

According to provisions outlined in Section 504 of the *Rehabilitation Act of 1973* and the *Americans with Disabilities Act*, students with disabilities are ensured equal access and reasonable academic adjustments and accommodations by institutions of higher learning.

The Office of Services for Students with Disabilities is part of the Student Assistance Center in the Division of Student Affairs. It is the responsibility of this office to provide students with disabilities the necessary services that will ensure the opportunity for full participation in University academic programs, activities, and services.

If a student has a specific disability, he or she should contact the Office of Services for Students with Disabilities, Spicer Hall 124, (330) 972-7928 (Voice), or (330) 972-5764 (TDD).

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## CENTER FOR CHILD DEVELOPMENT

The University of Akron Center for Child Development provides a variety of early childhood programs which are open to students, faculty, staff, and the community. Each classroom is staffed with a Pre-K certified teacher and student aides. Opportunities are provided for the children to engage in developmentally appropriate activities in the following areas: creative art, language arts, music and rhythms, science exploration, gross motor and fine motor development, socio-dramatic play, multi-sensory activities, and computer experience. The program emphasizes the development of a positive self concept through an anti-bias curriculum.

The Center for Child Development is open during the Fall and Spring semesters of the academic year between 7:30 a.m. and 6:00 p.m. Monday through Friday. The program offers hourly flextime and half-day programs for children three to five years old and toilet trained. Full-day sessions are available year round for children two-and-a-half to five years old and toilet trained.

A summer pre-school flextime program is offered Summer Session I.

A summer program is also offered for school-aged children. This program is offered during Summer Sessions I and II from 7:00 until 6:00 p.m.

For more information call the Center for Child Development, (330) 374-8210.

## GARDNER STUDENT CENTER

The Gardner Student Center, located in the center of campus, serves the students, faculty, and staff, and is one of the University's major assets in meeting the University-wide goal of public service. This busy facility houses four food service facilities, meeting rooms, lounges, Gardner Theatre, student organization offices, recreation facilities, the Communication Center, a bank, Ticketmaster/Film Center, and a bookstore.

- **Food Areas** in the Gardner Student Center offer a variety of food items. On the first level, the Crackerery features the services of a fast-food operation, a pizza & Mexican shop, and an ice cream and yogurt shop. For more of a cafeteria-style offering, the Hilltop, on the second level, provides deli-style selections at Sara Lee's, as well as full catering for banquets and meals.
- **Gardner Theatre**, located on the upper level, screens first- and second-run movies twice per night, Tuesday through Sunday and is open to the public.
- The **Game Room**, located on the lower level of the Gardner Student Center, is open seven days a week for the convenience of the University family to enhance free time activity. The Game Room offers eight bowling lanes, 16 billiard tables, foosball, and a variety of video games. For the competitive individual, tournaments in many of these recreational activities are programmed each semester by the Game Room staff.
- The **Communication Center**, located in the lobby of Gardner Student Center offers the following services: informational and referral services; copying, including color; oversized and reduced copies; binding of materials; mailing facilities for campus and U.S. mail; literature distribution; and class support files.
- The **Ticketmaster/Film Center**, located in the lobby of Gardner Student Center (330) 972-6604, sells tickets to most events in northern Ohio, including Blossom Music Center, The IX Center, Playhouse Square, Public Hall, and the Jacobs Field and Gund Arena. Over-the-counter sales include tickets to campus functions, including sporting events, and to local shows. Film and film processing services are also available.
- The **Bookstore at The University of Akron** is operated as a service of Barnes & Noble Bookstores, Inc. of New York City. Barnes & Noble operates 300 other college stores. The primary purpose of the Bookstore is to make available books and supplies required for course work. In addition, the store also carries a wide range of classroom supplies, paperbacks, engineering and art supplies, greeting cards, University memorabilia, clothing and other sundry items.

# Campus Safety and Security Information

## Safety and Security

This information is provided as part of The University of Akron's commitment to safety and security on campus and is in compliance with the Federal Crime Awareness and Campus Security Act of 1990.

## The Campus

The University of Akron is the third-largest university in Ohio with a main campus enrollment of 28,000 students from throughout Ohio, the United States, and more than 83 foreign countries. Within a 170-acre campus, the University now reaches into downtown Akron with the continuing renovation of the former Pol-sky's department store for classroom and office space.

The University employs many people to keep the campus safe and secure. The Division of Administrative Services provides for student and employee safety and security through the departments of Environmental and Occupational Health and Safety, Physical Facilities, and University Police. The Division of Student Affairs is responsible for security and safety policies governing residence halls, fraternities, and sororities and for teaching students about security and crime prevention.

It is the intent of the University to continue and enhance current safety and security education and awareness programs throughout the year. The purpose of these programs is to assure that the campus community frequently receives information and instruction on University crime and safety policies and procedures, and on drug and alcohol control and prevention.

A safe campus can be achieved only with the cooperation of the entire campus community. The University hopes students will read and become familiar with this material and be responsible for their own safety and the security of others.

## University Police

Campus law enforcement is primarily the responsibility of The University of Akron Department of Police. University police provide 24-hour-a-day patrol protection to the campus, parking lots, residence halls, and on-campus fraternity and sorority houses. The police station is located in the Physical Facilities Operation Center at the corner of Hill and South Forge streets and is staffed 24 hours a day by full-time dispatchers.

The University's 28 police officers are commissioned by the State of Ohio with full law enforcement authority and responsibilities identical to the local police or sheriff. The UA Police Department works closely with the Akron Police Department and other law enforcement agencies. Reports are exchanged every business day so that both agencies receive pertinent information. Information is shared through personal contacts and by phone and radio. University and City of Akron police regularly work together at large campus events such as athletic competitions and dances.

UA Police officers have met or exceeded the training standards of the Ohio Peace Officers Training Council. They also receive ongoing in-service and specialized training in first aid, CPR, firearms, defensive tactics, legal updates, and other skills.

UA Police officers enforce laws regulating underage drinking, the use of controlled substances, weapons, and all other incidents requiring police assistance. They also are responsible for public safety services such as crime reports, medical emergencies, fire emergencies, and traffic accidents.

It is the goal of every member of the University Police Department to promote, preserve, and deliver feelings of safety and security through quality services to the members of the University community.

## Drug and Alcohol Prevention

The issue of drug and alcohol abuse concerns the entire University community as well as our surrounding neighborhoods. The federal *Drug Free Schools and Communities Act Amendments of 1989* require schools, colleges, and universities receiving federal financial assistance to implement and enforce drug and alcohol prevention programs for students and employees.

The University of Akron prohibits the illegal use, possession, sale, manufacture, or distribution of drugs and alcohol by all students and employees on University premises or as part of any University activity. Any misuse of substances by University students and employees that presents physical or psychological hazard to individuals also is prohibited.

It is the responsibility of The University of Akron to adopt and implement a drug prevention program for its students and employees. The University as an institution, and each of us as individuals, must eliminate the use of illicit drugs and alcohol that contribute to the unrecoverable loss of time, talent, and lives.

In accordance with the Drug Free Schools and Communities Act Amendment of 1989, The University of Akron established the Chemical Abuse Resource Education (C.A.R.E.) Center. The C.A.R.E. Center is funded in part by the Fund for Post Secondary Education, U.S. Department of Education. To receive resource, speaker and/or program information, call 972-5653 or stop by Gardner Student Center 210.

## Crime Prevention

Through the Office of Crime Prevention, University police officers provide educational programs to students and employees on personal safety, sexual assault/acquaintance rape prevention, drug and alcohol abuse prevention, and related topics. The University Police Department welcomes the chance to talk with any campus group. Candid dialogue between UA Police and the public has created greater confidence in the community to report unlawful activities.

Potential illegal actions and on-campus emergencies can be confidentially reported by any student, faculty, or staff member. Complaints received by UA police which fall outside their jurisdiction will be referred to the appropriate agency, or the complainant will be provided a phone number where the complaint can be filed. Likewise, other agencies refer complaints to University Police when appropriate.

Two police officers patrol parking lots from 7 a.m. until the latest evening classes let out. UA police also offer assistance to motorists with battery jumps, inflating tires, unlocking vehicles, and obtaining fuel for a small fee.

To request nonemergency assistance, call extension 7123. To schedule an appointment for an educational program, call extension 5454.

For emergencies, dial 911 from any campus telephone.

## Student Campus Patrol

A student escort service operates 5 p.m. to 1 a.m. seven days a week for the safety of anyone walking alone on campus during the evenings. By calling extension 7263, an escort will come to the student's location and accompany him/her to any campus building or parking lot.

Employed and trained by The University of Akron Police Department, the campus patrol teams are easily identified by labeled royal blue jackets or yellow t-shirts. These teams assist the University police in patrolling campus parking lots and other campus areas and report suspicious individuals or activities directly to the police dispatch center.

### Emergency Phones

Yellow or red emergency phones are directly connected to the UA Police Department. These phones are strategically located throughout campus pedestrian walkways and inside parking decks. Police respond to the lifting of any emergency phone receiver, even if no words are spoken.

Outdoor security phones are at the main entrances of all campus residence halls. UA Police and other campus numbers can be dialed on these phones.

If using an off-campus phone, dial 972 before the campus extension.

### Campus Buildings

Most University academic facilities are open to the public from 7 a.m. until the latest evening classes let out. Administrative buildings are generally locked at 6 p.m. When the University is closed, all buildings are locked and may be opened only by authorized personnel.

### Health and Safety

Members of the Department of Environmental and Occupational Health and Safety routinely inspect the campus for environmental and safety concerns. The Department of Physical Facilities maintains University buildings and grounds and regularly inspects facilities and promptly makes repairs to ensure safety and security. University Police work with both units to respond to reports of potential safety and security hazards, such as broken windows and locks. UA police also work with physical facilities personnel to help maintain adequate exterior lighting and safe landscaping practices.

### Personal Responsibility

The cooperation and involvement of students, faculty, and staff in any campus safety program is absolutely necessary. All must assume responsibility for their own safety and security of their property by following simple, common sense precautions. For example, although the campus is well-lighted, everyone should confine their movements to well-traveled areas. There is safety in numbers, and everyone should walk with a companion or with a group at night. Valuables should be marked with a personal identification number in case of loss or theft. Bicycles should be properly secured when not in use. Automobiles should be locked at all times. Valuables and purses should never be lying in view in a car but locked in the car trunk for safekeeping.

### Crime Statistics

The University of Akron Police Department prepares monthly statistics for the Federal Bureau of Investigation under the Uniform Crime Reporting (UCR) program. The serial numbers of property stolen on campus are reported nationwide through the National Crime Information Center. A LEADS computer terminal at the police station dispatch center allows information to be exchanged with law enforcement agencies across the United States and Canada.

The following statistics are from the University Uniform Crime Reports of the past five calendar years. The statistics under Off-campus (O.C.) are crimes reported to the City of Akron Police Department that occurred at University properties off campus.

CRIME	NUMBER OF REPORTS									
	92	O.C. 92	93	O.C. 93	94	O.C. 94	95	O.C. 95	96	O.C. 96
<b>Homicide</b>	0	0	0	0	0	0	0	0	0	0
<b>Rapes</b>	1	0	0	0	2	0	4	15	3	0
<b>Robbery</b>	0	5	7	1	2	0	3	41	4	0
<b>Aggravated Assault</b>	0	3	6	5	1	0	8	21	3	0
<b>Burglary</b>										
Forcible Entry	2	33	11	0	10	0	3	126	3	0
Unlawful Entry (no force)	0	5	8	0	11	0	1	42	7	0
Attempted Forcible Entry	0	11	7	0	3	0	1	2	1	0
Burglary Total	2	49	26	5	24	0	5	170	11	0
<b>Theft</b>										
Under \$50	0	183	17	1	15	0	139	NA	125	1
\$50 to \$200	1	171	18	3	18	0	146	NA	136	0
\$200 and Over	1	108	16	5	18	0	150	NA	169	1
Theft Total	2	462	51	9	51	0	435	NA	430	2
<b>Motor Vehicle Theft</b>	0	5	18	1	28	0	13	5	8	0
<b>Arson</b>	0	1	12	0	1	0	1	11	2	0

CRIME	NUMBER OF ARRESTS									
	92	O.C. 92	93	O.C. 93	94	O.C. 94	95	O.C. 95	96	O.C. 96
Liquor Law Violations	35	0	64	54	32	54	55	NA	89	0
Drug Abuse Violations	3	0	6	0	15	1	9	NA	22	0
Weapons Possession	4	0	2	0	3	4	1	NA	3	0

NOTE: Off-campus statistics previous to 1996 reflect all activity in areas surrounding the University, including incidents not directly related to University functions.

## EMERGENCY PHONE NUMBERS

Call extension 911 on campus to reach UA police immediately.

Police .....	7123
Campus Patrol .....	7263
(Police Nonemergency) .....	8123
Environmental and Occupational Health and Safety .....	6866
<b>Fire .....</b>	<b>911</b>
<b>EMS/Medical .....</b>	<b>911</b>
Electrical/Plumbing .....	7415
Hazardous Materials .....	8123
Closing Information .....	7111

These emergency numbers are monitored 24 hours a day. If calling from an off-campus phone, dial 972 and then the four-digit number you wish to reach. Use 911 for emergencies when dialing from all campus extensions.

# Graduate School

Charles M. Dye, Ph.D., *Dean*  
 Lathardus Goggins, Ph.D., *Associate Dean*  
 Dollie Q. Markovich, B.A., *Coordinator of the Graduate School*  
 Karen L. Caldwell, *Secretary to the Dean and Coordinator of Graduate Financial Aid*  
 Virginia K. Donnelly, B.A., *Degree Completion Coordinator*  
 Brenda J. Henry, *Admissions Coordinator*  
 Heather A. Blake, B.S., M.S., *Receptionist*

## OBJECTIVES

The purpose of the Graduate School is to provide a quality program of education by the following means:

- Advanced courses in various fields of knowledge beyond the baccalaureate level.
- Opportunities to develop and apply research techniques and to use the resources appropriate to various graduate programs.
- Advancement of student's knowledge for the benefit of mankind through the efforts of its faculty and students.

## Nature of Graduate Education

The Graduate School provides a qualified student with education which may be required for the full development of scholarly and professional capacities, subject to the criteria developed by graduate departments.

Graduate education involves the extension of knowledge. However, it is by no means a mere continuation of undergraduate study. At its best, graduate education is characterized by an able and enthusiastic advanced student who joins faculty leaders to form a community of scholars dedicated to the common pursuit of truth. Critical analysis, independence of thought, originality of method, intensity of purpose, freedom from bias, thoroughness of inquiry, keenness of perception and vital creativity combine to produce in the successful student both the professional competence and the breadth of understanding essential to leadership in many areas of human endeavor.

## History of the Graduate School

Graduate study began a few years after Buchtel College opened its doors, and the first earned master's degree was conferred in 1882. The College of Education awarded its first master's degree in 1924, the Colleges of Engineering and Business Administration in 1959, the College of Fine and Applied Arts in 1967 and the College of Nursing in 1979. The Department of Communicative Disorders (previously the Department of Speech), now housed in the College of Fine and Applied Arts, was formerly a part of the Buchtel College of Arts and Sciences and conferred a master's degree in 1963. The first earned doctoral degrees were conferred in 1959. Professor Charles Bulger was appointed first dean of graduate work in 1933, and he continued in that capacity until 1950. Professor Ernest H. Cherrington, Jr. served as director of graduate studies from 1955 to 1960 and as dean of the Graduate Division from its establishment in 1960 to 1967. Dr. Arthur K. Brintnall was appointed dean of Graduate Studies and Research in 1967 being succeeded in 1968 by Dr. Edwin L. Lively. Dr. Claibourne E. Griffin succeeded Dr. Lively in 1974 and served in that capacity until 1977. Dr. Joseph M. Walton, associate dean of Graduate Studies and Research, was administrative head of the Graduate School during the 1977-78 academic year. Dr. Alan N. Gent was appointed dean of Graduate Studies and Research in 1978 and served in that capacity until 1986. Dr. Joseph M. Walton served as acting dean of Graduate Studies and Research from 1986 until 1989. In 1989 Dr. Patricia L. Carrell became dean of the Graduate School. Dr. Charles M. Dye was named interim dean in 1993 and became the dean of the Graduate School in 1995.

The administrative functions of the Graduate School include establishment of suitable entrance requirements, admission of qualified students, maintenance of high-quality instruction and approval of graduate requirements for advanced degrees.

## Graduate Programs

A qualified student who has completed the baccalaureate program with sufficiently high grades may continue studies through the University's Graduate School in a program leading to the master's degree as well as to the doctoral degree. An undergraduate student who qualifies may enroll in certain graduate-level classes and apply the credits earned to the total required for the baccalaureate degree. To receive graduate credit for the courses, however, the student must first be admitted to the Graduate School.

The Graduate School offers programs of advanced study leading to the degree of Doctor of Philosophy in chemistry, counseling psychology, elementary education, engineering (biomedical, chemical, civil electrical, engineering applied mathemat-

ics, mechanical, and polymer), guidance and counseling, history, polymer science, psychology, secondary education, sociology, and urban studies. The Doctor of Education degree is offered in educational administration. The Doctor of Philosophy program in sociology is a joint program with Kent State University. The Doctor of Philosophy program in urban studies is a joint program with Cleveland State University.

The school also offers programs of study leading to the master's degree with majors in the following areas: accountancy, applied politics\*, audiology\*\*, biology, biomedical engineering, bilingual-multicultural education, business administration (accounting, finance, health services administration, international business, management, marketing, materials management, and quality management; JD/MBA joint program), chemical engineering, chemistry, civil engineering, communication, counseling (classroom guidance for teachers, community counseling, elementary school counseling, marriage and family therapy, secondary school counseling), counseling psychology, economics (labor and industrial relations), educational administration (administrative specialists, assistant superintendent, elementary school administration, general administration, higher educational administration, school treasurer, secondary school administration, superintendent, supervisor), educational foundations (computer based education, educational psychology, historical foundations, instructional media and technology, social/philosophical foundations), electrical engineering, elementary education, engineering, English (composition), geography (urban planning), geology (earth science, engineering geology, environmental geology, geophysics), guidance and counseling, history, home economics and family ecology child development, child life, clothing/textiles/interiors, food science), management (human resources, information systems), mathematical sciences (applied mathematics, computer science, mathematics, statistics), mechanical engineering, middle school education, modern languages (Spanish), multicultural education, music (accompanying, composition, education, history/literature, performance, theory), nursing (RN/MSN), nutrition/dietetics, outdoor education, physical education (adapted physical education, athletic training for sports medicine, exercise physiology/adult fitness), physics, political science, polymer engineering, polymer science, psychology (applied cognitive aging, counseling, industrial/organizational), public administration and urban studies (JD/MPA joint program, public administration, urban studies), reading, social work, sociology, special education, speech-language pathology\*\*, taxation (JD/MTax joint program), technical education (administration, guidance, instructional technology, supervision, teaching, training) theatre arts (arts administration). In addition, the College of Education provides a year of study beyond the master's degree in the area of school superintendent.

Several departments offer a limited amount of work which may be taken on the graduate level. Such courses may supplement the major program of study for students who do not wish to devote their entire attention to one field.

\* Program pending approval of Ohio Board of Regents

\*\* Degree name change pending approval of Ohio Board of Regents

## Graduate Faculty and the Graduate Council\*

The graduate faculty is comprised of those members of the faculty who hold appointments at the rank of assistant professor or above and teach graduate courses, supervise theses and dissertations and are generally responsible for the graduate program at the University. They are appointed by the dean of the Graduate School after recommendation by the department, college dean and Graduate Council. Guidelines for recommendation and appointment include the following:

- Quality and experience in upper-level and graduate-level teaching.
- Possession of terminal degree in field.
- Scholarly publication record.
- Activity in research.
- Activity in profession or discipline.

The purpose of the graduate faculty is to encourage and contribute to the advancement of knowledge through instruction and research of highest quality, and to foster a spirit of inquiry and a high value on scholarship throughout the University.

The graduate faculty recommends a student who has been nominated by the student's college faculty for the appropriate master's or doctoral degree.

Graduate Council is elected by the graduate faculty. Membership in the council presently includes two members from the College of Engineering, two members from the College of Business Administration, two members from the College of Education, four members from the Buchtel College of Arts and Sciences, two members from the College of Fine and Applied Arts, one member from the College of Nursing, one member from the College of Polymer Science and Polymer Engineering, and one student member elected yearly by the Graduate Student Council. Members serve three-year terms and may not succeed themselves. The dean of the Graduate School serves as chair of both the graduate faculty and the Graduate Council.

The functions of the council include examination of proposed graduate programs and course offerings, recommendation of policy for all phases of graduate education, recommendation of persons for membership in the graduate faculty and advising and counseling the dean in administrative matters.

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\*An exclusive listing of graduate faculty and Graduate Council can be found in the "Directory" of the *Graduate Bulletin*.

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## **Graduate Student Government**

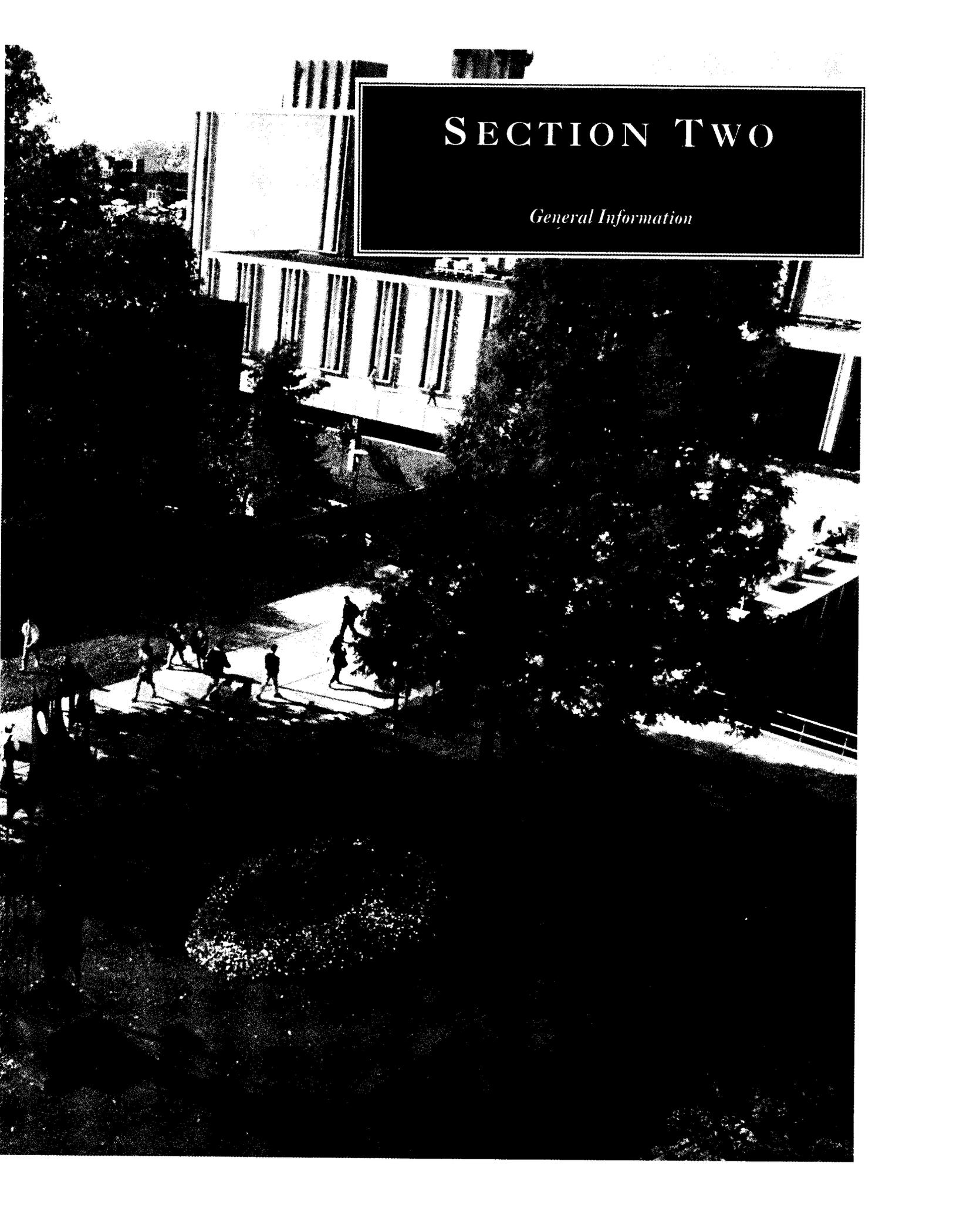
All registered graduate students at the University are constituents of the Graduate Student Government (GSG). The government council consists of elected representatives from each of the graduate departments, an executive board of officers, and a faculty adviser.

The objectives of GSG are to govern graduate student affairs, represent graduate student sentiment, and promote interdepartmental social exchange and interaction between students. These objectives are met by appointing members to participate in various administrative committee meetings, such as the Faculty Senate, Graduate Council and Board of Trustees meetings.

Anyone wishing more information or anyone who wants to air a complaint, problem or suggestion concerning graduate students may contact the Graduate School or attend the bimonthly GSG meetings, where all graduate students are welcome.

# SECTION TWO

*General Information*



# General Information

## REGULATIONS

### Student Responsibility

A student assumes full responsibility for knowing the regulations and pertinent procedures of the Graduate School as set forth in this *Bulletin*. Normally, the degree requirements in effect at the time a student is admitted to a program will apply through graduation. However, if existing programs are revised, the student has the option of pursuing the revised program as long as all requirements in the revised program are met. Additional information pertaining to programs can be obtained from the appropriate department head.

### Admission

Every person who desires to enroll in or audit any graduate credit course must be first admitted or approved by the Graduate School.

Applications for admission to the Graduate School should be submitted to the dean of the Graduate School at least six weeks before the start of the term for which admission is sought in order to allow adequate time for complete processing. No applications will be accepted after the University deadline for applications, which is usually about three weeks before the beginning of a term and is published in the *Schedule of Classes*. Some programs, such as nursing, counseling and counseling psychology, have earlier deadlines. Applicants should contact the departments for more detailed application information.

Each first-time application to the Graduate School must be accompanied by an application fee. The fee for **domestic** students is \$25. The fee for **international** students is \$50.

An official transcript from each college or university attended must also be received by the Graduate School before the application will be processed. This applies to the complete academic record, both undergraduate and graduate. Transcripts should be sent from the institutions attended directly to the Graduate School. The applicant is responsible for seeing that the above conditions are met by the deadlines for filing applications.

All records, including academic records from other institutions, become part of the official file and cannot be returned for any purpose. An offer of admission will normally be made to an applicant who meets all admission requirements. However, it must be recognized that staff, facilities and other resources are limited, so the number of students accepted will vary among departments and from term to term. An accepted applicant may begin graduate work in the fall, spring or summer semester. The offer of admission is void, however, if the applicant does not register for courses within two years from the time of admission. An individual whose offer of admission has lapsed must submit a new application to be reconsidered.

The student is admitted only for the purpose or objective stated on the application for admission. A new request for admission must be filed when the original objective has been attained or when the student wishes to change objectives.

The admitted status terminates when the time limits have been exceeded or other conditions for continued admitted status have not been met.

No student will be admitted without approval and acceptance by a department within the University, but admission to a department does not necessarily imply admission to or candidacy for any graduate degree program in that department. Admission for graduate study in any program can only be granted by the dean of the Graduate School.

### Nonaccredited American School Graduates

A student holding a baccalaureate degree from a non-accredited American college or university, if otherwise qualified, is normally required to complete at least 10 semester credits of postbaccalaureate work at a 3.00 level before being considered for admission to the Graduate School. The accreditation status of the school at the time of the student's graduation shall apply. A student should consult with the department head in the major field to develop a postbaccalaureate program.

### Transfer Students

A graduate student matriculated in the Graduate School of another college or university who wishes to transfer to The University of Akron to continue graduate education must be in good standing at the other school.

### Entrance Qualifying Examinations

The use of examinations to determine admissibility to enter a graduate program or eligibility to continue in one is the prerogative of the departments offering graduate programs. The department has the right to select the examination and min-

imum acceptable level of performance. Information and procedure may be obtained from the head of the appropriate department.

### Classification

All students are identified by the Graduate School as being in one of the following categories. Any change must be arranged through the Graduate School.

- **Full Admission** may be given to any applicant who desires to pursue a graduate degree and has a baccalaureate degree from an accredited college or university with an overall grade-point average of 2.75 or better or 3.00 for the last two years (64 semester credits or equivalent); or holds an advanced degree from an accredited college or university in or appropriate to the intended field; or holds a baccalaureate or master's degree from a foreign college or university with first-class standing or its equivalent, plus satisfactory evidence of competence in English. Full admission may also be granted to applicants to the College of Business Administration who meet the college's admission requirements.
- **Provisional Admission** may be granted to a person who has not met all of the requirements for full admission (2.74-2.5 overall GPA or 2.75 over the last two years). This admission status permits a student to take up to 15 semester credits of graduate coursework. Graduate courses taken under this admission status may be applied to a graduate degree program, but only when all requirements for *full admission* have been met.
- **Deferred Admission** may be granted if the applicant's record does not meet provisional admission standards. After completion of a postbaccalaureate program of study with an appropriate GPA, as prescribed by the department (usually two to five courses), the student may be reconsidered for provisional admission to the Graduate School. No graduate-level coursework can be taken by a student under the *deferred admission* status.
- **Non-Degree Admission** may be granted to a person who wishes to take particular courses but who is not working toward a graduate degree. This admission status permits a student to take up to 15 semester credits of graduate coursework. Graduate courses taken under this admission status may be applied later to a graduate degree program, but only when all requirements for *full admission* have been met.
- **Special Workshop** status is for a person permitted to take workshops for graduate credit without being admitted to Graduate School. Such permission is granted by the workshop director upon receipt of a signed statement of possession of a baccalaureate degree by the applicant, and terminates upon completion of this workshop. A student admitted to special workshop status must apply through regular channels for any other category. A maximum of six workshop credits may be applied to degree work at a later date if the applicant is given *full admission* to the Graduate School.
- **Transient status** may be given to a person who is a regularly enrolled graduate student in good standing in a degree program at another accredited university and has written permission to enroll at The University of Akron. Such permission is valid only for the courses and semester specified, with a maximum of 10 semester credits allowable, and is subject to the approval of the instructor, department head and Graduate School. A transient student is subject to the same rules and regulations as a regularly enrolled student of the University.
- **Undergraduate status** is for an undergraduate student at the University who may be granted permission to take one or more graduate-level courses if all the following conditions are met.
  - senior standing;
  - overall grade-point average of 2.75 or better through preceding term (if a student does not have a 3.00 or better in the major field, special justification will be required);
  - written approval is given by the instructor of the course and the student's adviser.
 These courses may later be applied to a degree program if not used to satisfy baccalaureate degree requirements. The maximum number of graduate credits that may be taken by an undergraduate and applied later toward a graduate degree is 12.
- **Postdoctoral status is divided into three categories:**
  - a *Fellow* is a person holding an earned doctorate who is engaged in advanced research. A fellow shall be considered a guest of the University and provided space and use of facilities within limits of practical need of the undergraduate and graduate programs. Tuition and fees shall be collected if allowed under sponsoring contract for any courses the fellow may choose to take;
  - a *Special* is a person holding an earned doctorate who desires an additional graduate degree. A special may be admitted to any program upon submission of application forms, application fee (if new student) and an official transcript from the institution awarding the doctorate. This student will be treated as a regular student subject to registration fees and program degree requirements;
  - a *Guest* is a person holding an earned doctorate who desires to attend courses and seminars relevant to individual work or interest without registering or receiving grades. A written application should be submitted to the dean of the Graduate School for each course to be taken, and approval of the instructor, department head and college dean shall be obtained. A guest is welcome to

any course or seminar provided space is available. Normally, space and facilities for research cannot be provided for a postdoctoral guest but special requests will be considered. Requests should be submitted, in writing, to the dean of the Graduate School who will review such requests with the appropriate college dean and department head.

## Course Load

A full load of coursework at the graduate level is normally 9-15 semester credits including audit. Full-time status is defined as a minimum of 9 semester credits; or as defined by the Internal Revenue Service for those students with graduate assistantships.

## Registration

The responsibility for being properly registered lies with the student, who should consult with the assigned adviser in preparing a program of courses and/or research. A schedule of courses, hours, class location and registration procedures is obtainable from the registrar.

## Financial Assistance

The University awards a number of graduate assistantships to qualified students. Assistantships are normally awarded for up to two years of master's study and up to four years of doctoral degree study. These assistantships provide stipends of \$6,000 to \$18,000 plus remission of tuition and fees and are available in all departments with graduate degree programs. A graduate assistant renders service to the University through teaching, research, and other duties. For information and/or applications, contact the head of the department. Tuition scholarships are also available on a limited basis in some departments.

A number of fellowships sponsored by industry and government agencies are available in some departments. Stipends range up to \$13,000. For information, contact the head of the department.

Information about student loans can be obtained from the Office of Student Financial Aid.

Additional information concerning financial aid policies is available in the *Graduate Assistant Handbook* which can be obtained from the Graduate School.

## International Students

The University of Akron welcomes international students and seeks to make their educational experience pleasant and meaningful. Each year, approximately 810 international students and scholars from 91 countries pursue studies and research at The University of Akron.

## Admission

International students can apply to begin their graduate study for the Fall or Spring semester or for either of the University's two summer sessions. Students should submit their applications at least five months in advance of the date they wish to begin their studies. Graduate students applying for assistantships should submit applications nine months before the term begins for best consideration. The following procedures should be followed:

- Obtain an international student application from the International Admissions Officer, Office of International Programs, The University of Akron, Akron, OH 44325-3106, telephone (330) 972-6349, fax (330) 972-8604 (World Wide Web address: <http://www.uakron.edu/studentaffairs/international/IP-MAIN.html>); electronic mail address: [international@uakron.edu](mailto:international@uakron.edu). Return the completed application and the one-time nonrefundable application fee of \$50 with the following documentation:

- An official transcript and degree from all secondary institutions and universities attended previously. Original records in languages other than English must be accompanied by exact English translations and certified by the school, U.S. consulate or other legal certifying authority.
- Proof of English language proficiency. The University requires each student for whom English is not the native language to take the Test of English as a Foreign Language (TOEFL). This test is administered in major cities throughout the world. Applications may be obtained from binational agencies, United States Information Service (USIS) offices, or from the Educational Testing Service, Princeton, NJ 08540. Graduate applicants must achieve 550 or greater. Exceptions include the departments of English and History (580), Public Administration and Urban Studies (570) and Biomedical Engineering (590).

Admission may be offered to students who are academically acceptable but who have not yet reached the level of English proficiency required for Full Admission, such students must attend intensive English instruction until they have attained the required level of English proficiency for full-time academic study.

- Proof of adequate financial support. An international student should submit the Declaration and Certification of Finances (DCF) and an original statement from the bank showing availability of sufficient funds to cover the cost of the first year of study. The Office of International Programs will prepare the Certificate of Eligibility (I-20A/B or IAP-66) upon receipt of adequate financial support and admission to the University.

## Costs, Financial Aid, and Medical Insurance

To cover tuition and living expenses for the 1997-98 academic year, international graduate students holding F-1 visas will need approximately \$17,929. Additional costs for J-1 visa holders and student's dependents are indicated on the DCF.

Graduate students may request financial aid through fellowships and graduate assistantships. A graduate student interested in applying for this aid should request the necessary forms when requesting the admission application.

The University of Akron requires that all international students carry medical insurance that meets minimum established requirements. Such health insurance coverage must be in effect during their stay in the United States. International students will not be permitted to register without proof of such coverage.

## International Student Orientation

The required International Student Orientation takes place one week before classes begin and costs \$45. The orientation dates will be mailed to students with their orientation letter and immigration documents.

## Teaching Assistants

Applicants whose native language is not English and who expect to become teaching assistants, are also required to achieve a minimum score of 50 on the Test of Spoken English (TSE, Revised 1995). This exam must be taken prior to functioning as a teaching assistant. Those for whom English is the native language and who expect to become a teaching assistant must demonstrate proficiency in English through departmental certification. Neither the TSE nor departmental certification is required for research or administrative assistants.

**Note:** International students are encouraged to contact the Office of International Programs directly with questions about housing, climate, insurance, or immigration regulations. Questions concerning degree programs should be directed to the appropriate academic department.

## Course Numbering System

Each course at the University has two numbers. One designates the college and department of which it is a part; one specifies the subject matter of the particular course. For instance:

3300:507 Middle English Literature

In the above example, the first four digits of the number (3300) indicate the college and department. In the case, 3000 represents the Buchtel College of Arts and Sciences; 300 refers to the Department of English. The second set of digits (507) following the colon, indicates exactly which course in the Department of English is being specified. The course number also indicates the level at which the course is being taught and the point at which the student is ready to take the course.

An explanation of that numbering system follows:

500-699 Master's-level courses  
600-799 J.D.-level courses  
700-899 Doctoral-level courses

When approved 400-level undergraduate courses are taken for graduate credit, they become 500-level courses. A student must apply for and be admitted to the Graduate School before registering for graduate credit.

## Grades

A student admitted to graduate study under any status at the University is expected to maintain a minimum 3.00 grade-point average (4.00 = "A") at all times. A minimum grade-point average of 3.00 is required for graduation. No more than six semester credits of "C+", "C", and "C-" grades may be counted toward the degree. Grades of "D+", "D", and "D-" are treated as "F" grades. No grades below "C-" may be counted toward a degree.

Official academic records for graduate students are maintained with a grade-point system as follows:

Grade	Quality Points	Key
A	4.0	
A-	3.7	
B+	3.3	
B	3.0	
B-	2.7	
C+	2.3	
C	2.0	
C-	1.7	
D+	0.0	
D	0.0	
D-	0.0	
F	0.0	Failure
CR	0.0	Credit
NC	0.0	No credit
AUD	0.0	Audit

The following grades may also appear on the term grade reports or on the official academic record. There are no grade points associated with these grades.

**I** – Incomplete: Indicates that the student has done passing work in the course but that some part of the work is, for good and acceptable reason, not complete at the end of the term. Failure to make up the omitted work satisfactorily by the end of the following term, not including summer sessions, converts the “I” to an “F.” When the work is satisfactorily completed within the allotted time the “I” is converted to whatever grade the student has earned.\*

**IP** – In Progress: Indicates that the student has not completed the scheduled course work during the term because the nature of the course does not permit completion within a single term, such as work toward a thesis.

**PI** – Permanent Incomplete: Indicates that the student’s instructor and the instructor’s dean have for special reason authorized the change of an incomplete (“I”) or an in progress (“IP”) to a permanent incomplete (“PI”).

**W** – Withdraw: Indicates that the student registered for the course but withdrew officially sometime after the second week of the term.

**NGR** – No Grade Reported: Indicates that, at the time grades were processed for the present issue of the record, no grade had been reported by the instructor.

**INV** – Invalid: Indicates the grade reported by the instructor for the course was improperly noted and thus unacceptable for proper processing.

\*If instructors wish to extend the “I” grade beyond the following term for which the student is registered, prior to the end of the term they must notify the Office of the Registrar in writing of the extension and indicate the date of its termination. It is the responsibility of the student to make arrangements to make up the incomplete work. The faculty member should submit the new grade to the Office of the Registrar in writing.

## Repeating Courses

Any graduate course may be repeated once for credit. However, the degree requirements shall be increased by the credit hour value of each course repeated. The hours and grades of both the original and the repeated section shall be used in computing the grade-point average. Required courses in which a “D” or “F” was received must be repeated.

## Audit Policy

A student choosing to audit a course must be admitted and indicate audit at the time of registration. The student pays the enrollment fee and may be expected to do all the work prescribed for students taking the course for credit, except that of taking the examination. Any faculty member may initiate withdrawal for a student not meeting these expectations.

## Thesis and Dissertation Credits

Course number 699 will only be used for courses which indicate credit is being given for a master’s thesis. 899 will only be used for courses which indicate credit is being given for a doctoral dissertation. No credit for 699 or 899 will be given unless the thesis or dissertation is completed.

## Colloquia, Seminars and Workshops

**Colloquium** (credit/noncredit grading)—A course that normally involves guests, faculty or graduate students as speakers. The intent of the course is to introduce a broad range of topics using resource personnel. Normally, assignments are limited to class participation.

**Seminar** (letter grades)—A course that normally involves group discussion or other activities based on assigned material. Grades are awarded based on a combination of assignments, tests and class participation.

**Workshop** (credit/noncredit grading)—A course that normally operates over a shorter period than a semester or a summer session. Workshops focus on a particular aspect or aspects of a field of study, require a combination of assignments, tests and class participation, and may or may not be permitted to satisfy degree requirements.

## Probation and Dismissal

Any student whose grade-point average falls below 3.00 is no longer in good standing and will be placed on probation. In consultation with the college or department, as appropriate, the dean of the Graduate School will dismiss full-time students who do not return to good academic standing within two consecutive semesters (excluding summers) and part-time students who do not return to good academic standing within the attempting of 15 additional credits.

For the purpose of administration of the full-time and part-time provisions of this policy, full-time and part-time status are determined by the semester in which the student goes on probation. Full-time enrollment constitutes nine or more graduate credits; part-time is less than nine graduate credits.

The dean of the Graduate School, with the approval of the relevant department head, may also dismiss anyone who fails to make satisfactory progress toward declared goals or who accumulates six semester credits of “C+” or below. The accumulation of six semester credits of “F” will result in mandatory dismissal.

A student dismissed from the Graduate School for academic reasons may not be readmitted for one calendar year, and then only if evidence for expecting satisfactory performance is submitted and found acceptable.

## Commencement

Students earning graduate degrees are expected to participate in the commencement exercises. A degree candidate who has legitimate reasons for graduating “In Absentia” should make a written request to the registrar within the established dates and pay the designated fee.

Students must apply to graduate in advance of completing degree requirements. Applications are filed with the Graduation Office which observes the following deadlines:

- Spring graduation: September 15.
- Fall graduation: May 15.

## Academic Dishonesty

Students at The University of Akron are an essential part of the academic community, and enjoy substantial freedom within the framework of the educational objectives of the institution. The freedom necessary for learning in a community so rich in diversity and achieving success toward our educational objectives requires high standards of academic integrity. Academic dishonesty has no place in an institution of advanced learning. The University’s community is governed by the policies and regulations contained within the *Student Code of Conduct* available in the Office of Student Conduct, Gardner Student Center 104, (330) 972-7021.

The University of Akron considers academic integrity an essential part of each student’s personal and intellectual growth. Instances of academic dishonesty are addressed consistently. All members of the community contribute actively to building a strong reputation of academic excellence and integrity at The University of Akron.

It is each student’s responsibility to know what constitutes academic dishonesty and to seek clarification directly from the instructor if necessary. Examples of academic dishonesty include, but are not limited to:

- Submission of an assignment as the student’s original work that is entirely or partly the work of another person.
- Failure to appropriately cite references from published or unpublished works or print/non-print materials.
- Unauthorized copying of an assignment in computer programming, or the unauthorized examination of a view of the computer, specifically during examinations.
- Possession and/or unauthorized use of tests, notes, books, calculators or formulas stored in calculators not authorized by the instructor during an examination.
- Providing and/or receiving information from another student other than the instructor, by any verbal or written means.
- Observing or assisting another student’s work.
- Violation of the procedures prescribed by the professor to protect the integrity of the examination.
- Cooperation with a person involved in academic misconduct.

A student who has been accused of academic dishonesty will be asked to meet with the course instructor. The matter can be resolved informally at the College level and/or an academic sanction can be imposed. If the student opposes the decision, he/she may appeal to the College Dean.

A further discussion of these procedures and other avenues for recourse can be found in the *Grievance Procedures for Graduate Students*, available at the Graduate School, The Polsky Building 469, and included in the **Appendix** of this *Bulletin*.

## Ohio Residency Requirements

Payment of a non-resident surcharge is required of any student who does not qualify as a permanent resident of Ohio as defined by one or more of the following sections:

3333-1-10 of the Ohio Revised Code

### A. Intent and Authority

1. It is the intent of the Ohio Board of Regents in promulgating this rule to exclude from treatment as residents, as that term is applied here, those persons who are present in the state of Ohio primarily for the purpose of receiving the benefit of a state-supported education.
2. This rule is adopted pursuant to Chapter 119 of the Revised Code, and under the authority conferred upon the Ohio Board of Regents by Section 3333.31 of the Revised Code.

### B. Definitions

For purposes of this rule:

1. A "resident of Ohio for all other legal purposes" shall mean any person who maintains a 12-month place or places of residence in Ohio, who is qualified as a resident to vote in Ohio and receive state welfare benefits, and who may be subjected to tax liability under Section 5747.02 of the Revised Code, provided such person has not, within the time prescribed by this rule, declared himself or herself to be or allowed himself or herself to remain a resident of any other state or nation for any of these or other purposes.
2. "Financial support" as used in this rule, shall not include grants, scholarships, and awards from persons or entities which are not related to the recipient.
3. An "institution of higher education" as used in this rule shall mean any university, community college, technical institute or college, general and technical college, medical college or private medical or dental college which receives a direct subsidy from the state of Ohio.
4. For the purpose of determining residency for tuition surcharge purposes at Ohio's state-assisted colleges and universities, "domicile" is a person's permanent place of abode; there must exist a demonstrated intent to live permanently in Ohio, and a legal ability under federal and state law to reside permanently in the state. For the purpose of this policy, only one (1) domicile may be maintained at a given time.
5. For the purpose of determining residency for tuition surcharge purposes at Ohio's state-assisted colleges and universities, an individual's immigration status will not preclude an individual from obtaining resident status if that individual has the current legal status to remain permanently in the United States.

### C. Residency for subsidy and tuition surcharge purposes

The following persons shall be classified as residents of the state of Ohio for subsidy and tuition surcharge purposes:

1. A dependent student, at least one of whose parents or legal guardian has been a resident of the state of Ohio for all other legal purposes for 12 consecutive months or more immediately preceding the enrollment of such student in an institution of higher education.
2. A person who has been a resident of Ohio for the purpose of this rule for at least 12 consecutive months immediately preceding his or her enrollment in an institution of higher education and who is not receiving, and has not directly or indirectly received in the preceding 12 consecutive months, financial support from persons or entities who are not residents of Ohio for all other legal purposes.
3. A dependent child of a parent or legal guardian or the spouse of a person who, as of the first day of a term enrollment, has accepted full-time self-sustaining employment and established domicile in the state of Ohio for reasons other than gaining the benefit of favorable tuition rates. Documentation of full-time employment and domicile shall include both of the following documents:
  - a. A sworn statement from the employer or the employer's representative on the letterhead of the employer or the employer's representative certifying that parent or spouse of the student is employed full-time in Ohio.
  - b. A copy of the lease under which the parent or the spouse is the lessee and occupant of rented residential property in the state; a copy of the closing statement on residential real property located in Ohio of which parent or spouse is the owner and occupant; or if parent or spouse is not the lessee or owner of the residence in which he or she has established domicile, a letter from the owner of the residence certifying that parent or spouse resides at that address.

### D. Additional criteria which may be considered in determining residency for the purpose may include but are not limited to the following:

1. Criteria evidencing residency:
  - a. if a person is subject to tax liability under Section 5747.02 of the Revised Code;

- b. if a person qualifies to vote in Ohio;
- c. if a person is eligible to receive state welfare benefits;
- d. if a person has an Ohio driver's license and/or motor vehicle registration.

### 2. Criteria evidencing lack of residency:

- a. if a person is a resident or intends to be a resident of another state or nation for the purpose of tax liability, voting, receipt of welfare benefits, or student loan benefits (if the loan program is only available to residents of that state or nation);
- b. if a person is a resident or intends to be a resident of another state or nation for any purpose other than tax liability, voting or receipt of welfare benefits.

### E. Exceptions to the general rule of residency for subsidy and tuition surcharge purposes.

1. A person who is living and is gainfully employed on a full-time or part-time and self-sustaining basis in Ohio and who is pursuing a part-time program of instruction at an institution of higher education.
2. A person who enters and currently remains upon active duty status in the United States military service while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile.
3. A person on active duty status in the United States military service who is stationed and resides in Ohio and his or her dependents shall be considered residents of Ohio for these purposes.
4. A person who is transferred by his or her employer beyond the territorial limits of the 50 states of the United States and the District of Columbia while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile as long as such person has fulfilled his or her tax liability to the state of Ohio for at least the tax year preceding enrollment.
5. A person who has been employed as a migrant worker in the state of Ohio and his or her dependents shall be considered a resident for these purposes provided such person has worked in Ohio at least four months during each of the three years preceding the proposed enrollment.

### F. Procedures

1. A dependent person classified as a resident of Ohio for these purposes (under the provisions of Section C.1. of this rule) and who is enrolled in an institution of higher education when his or her parents or legal guardian removes their residency from the state of Ohio shall continue to be considered a resident during continuous full-time enrollment and until his or her completion of any one academic degree program.
2. In considering residency, removal of the student or the student's parents or legal guardian from Ohio shall not, during a period of 12 months following such removal, constitute relinquishment of Ohio residency status otherwise established under paragraphs C.1. or C.2. of this rule.
3. For students who qualify for residency status under C.3., residency status is lost immediately if the employed person upon whom resident student status was based accepts employment and establishes domicile outside Ohio less than 12 months after accepting employment and establishing domicile in Ohio.
4. Any person once classified as a nonresident, upon the completion of 12 consecutive months of residency, must apply to the institution he or she attends for reclassification as a resident of Ohio for these purposes if such person in fact wants to be reclassified as a resident. Should such person present clear and convincing proof that no part of his or her financial support is or in the preceding 12 consecutive months has been provided directly or indirectly by persons or entities who are not residents of Ohio for all other legal purposes, such person shall be reclassified as a resident. Evidentiary determinations under this rule shall be made by the institution which may require, among other things, the submission of documentation regarding the sources of a student's actual financial support.
5. Any reclassification of a person who was once classified as a nonresident for these purposes shall have prospective application only from the date of such reclassification.
6. Any institution of higher education charged with reporting student enrollment to the Ohio Board of Regents for state subsidy purposes and assessing the tuition surcharge shall provide individual students with a fair and adequate opportunity to present proof of his or her Ohio residency for purposes of this rule. Such an institution may require the submission of affidavits and other documentary evidence which it may deem necessary to a full and complete determination under this rule.

## Fees

All fees reflect charges in 1997-98 and are subject to change without notice.

*Application Fee* (this fee is not refundable under any circumstances)

Domestic	\$25
International	\$50

*Tuition Fees*

Resident student per credit	\$164.85
Nonresident student per credit	\$308.15

(same fees apply when auditing classes)

*General Fee*

1-12 credits per semester	\$6.30 per credit
13 credits and over per semester	\$75.55 per semester

*Parking Permit Fee*

5 or more credits per semester	\$57.50
4½ or fewer credits per semester	\$34.50
One summer session	\$20.50
Workshop participants	\$2 per day up to \$16

*Graduation Fees*

Each degree (except law)	\$30
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*Other Fees*

Thesis and binding (payable at time of application for degree) binding per volume	\$9.50
Microfilming (Ph.D./Ed.D. only) (payable at time of application for degree)	\$60.00
Copyright Fee (payable at time of application for degree if copyright is sought)	\$35
Course schedule change fee (for each schedule change form processed)	\$5
Transcripts (if more than one transcript of a student's academic record is ordered by a student at one time, the fee shall be \$4 for the first transcript and \$2 for each additional one.)	\$4
Graduate Student's Foreign Language Reading Proficiency Exam	\$50
Late Graduation Application Fee	\$10
Late Registration Fee	\$25

• **Course Materials and Computing Fees:**

For the following graduate courses, the fee noted will be assessed to cover the cost of instructional materials distributed by the instructor and computing fees:

Course Number	Course Title	Credits	Course Fee
<b>Buchtel College of Arts and Sciences</b>			
3100:500	Food Plants	2	\$ 10
3100:521	Tropical Field Biology	4	\$175
3100:522	Conservation of Biological Resources	4	\$ 5
3100:524	Freshwater Ecology	3	\$ 15
3100:526	Applied Aquatic Ecology	3	\$ 15
3100:533	Pathogenic Bacteriology	4	\$ 50
3100:535	Virology	4	\$ 50
3100:537	Immunology	4	\$ 50
3100:540	Mycology	4	\$ 15
3100:541	Plant Development	4	\$ 15
3100:542	Plant Anatomy	3	\$ 15
3100:543	Physiology	4	\$ 15
3100:545	Plant Morphology	4	\$ 15
3100:547	Plant Physiology	3	\$ 15
3100:548	Economic Botany	2	\$ 5
3100:551	General Entomology	4	\$ 10
3100:553	Invertebrate Zoology	4	\$ 25
3100:554	Parasitology	4	\$ 15
3100:556	Ornithology	4	\$ 15
3100:558	Vertebrate Zoology	4	\$ 10
3100:561	Human Physiology	4	\$ 25
3100:562	Human Physiology	4	\$ 25
3100:564	General and Comparative Physiology	4	\$ 50
3100:566	Vertebrate Embryology	4	\$ 30
3100:567	Comparative Vertebrate Morphology	4	\$ 25
3100:625	Basic DNA Techniques	3	\$ 50
3100:682	Eucaryotic Techniques DNA	3	\$ 15
3100:684	Eucaryotic Techniques RNA	3	\$ 15
3100:685	Animal Cell Culture	4	\$ 50
3100:688	Principles of Transmission Electron Microscopy	3	\$ 20
3100:689	Principles of Scanning Electron Microscopy	3	\$ 20
3150:505	Biochemistry Laboratory	2	\$ 25
3250:527	Economic Forecasting	3	\$ 10
3250:626	Statistics for Econometrics	3	\$ 10
3250:627	Econometrics	3	\$ 10
3250:628	Seminar: Research Methods	3	\$ 10
3350:503	Computer Applications in Geography and Planning	3	\$ 10
3350:505	Geographic Information Systems	3	\$ 10
3350:507	Advanced Geographic Information Systems	3	\$ 10
3350:536	Urban Land Use Analysis	3	\$ 10
3350:540	Principles of Cartography	3	\$ 10
3350:542	Thematic Cartography	3	\$ 10
3350:544	Applications in Cartography and GIS	3	\$ 10
3350:547	Introduction to Remote Sensing	3	\$ 10

3350:548	Advanced Cartography	3	\$10
3350:549	Advanced Remote Sensing	3	\$10
3350:583	Spatial Analysis	3	\$10
3350:595	Soil and Water Field Studies	3	\$10
3350:637	Methods of Planning Analysis I	3	\$10
3350:638	Methods of Planning Analysis II	3	\$10
3350:680	Advanced Spatial Analysis	3	\$10
3370:505	Archaeological Geology	3	\$15
3370:510	Regional Geology of North America	3	\$25
3370:511	Glacial Geology	3	\$25
3370:521	Coastal Geology	3	\$25
3370:525	Advanced Stratigraphy	3	\$25
3370:532	Optical Mineralogy and Introductory Petrography	3	\$25
3370:533	Advanced Petrography	3	\$25
3370:535	Petroleum Geology	3	\$25
3370:536	Coal Geology	3	\$25
3370:537	Economic Geology	3	\$25
3370:541	Fundamentals of Geophysics	3	\$15
3370:546	Exploration Geophysics	3	\$15
3370:549	Borehole Geophysics	3	\$15
3370:550	Advanced Structural Geology	3	\$25
3370:562	Advanced Paleontology	3	\$25
3370:563	Micropaleontology	3	\$25
3370:570	Geochemistry	3	\$25
3370:572	Stable Isotope Geochemistry	3	\$25
3370:574	Groundwater Hydrology	3	\$25
3370:581	Analytical Methods in Geology	2	\$10
3370:584	Geoscience Information Acquisition and Management	1	\$ 5
3370:608	Remote Sensing in Geology	3	\$15
3370:610	Applied Quantitative Geomorphology	3	\$15
3370:623	Carbonate Petrology	3	\$15
3370:624	Siliciclastic Sedimentology	3	\$15
3370:631	Rocks and Minerals	4	\$15
3370:632	Igneous Petrology	3	\$15
3370:633	Metamorphic Petrology	3	\$15
3370:634	Clay Mineralogy	3	\$15
3370:638	Ore Microscopy	3	\$15
3370:639	Nuclear Geology	3	\$15
3370:643	Geostatistics	3	\$15
3370:656	Global Tectonics	3	\$15
3370:661	Geologic Record of Past Global Change	3	\$15
3370:674	Advanced Ground Water Hydrology	3	\$15
3370:675	Geochemical Methods of Prospecting	2	\$15
3370:678	Urban Geology	3	\$15
3450:527	Introduction to Numerical Analysis	3	\$10
3450:528	Numerical Linear Algebra	3	\$10
3450:529	Numerical Solutions: Ordinary Differential Equations	3	\$ 5
3450:530	Numerical Solutions: Partial Differential Equations	3	\$10
3450:535	Systems of Ordinary Differential Equations	3	\$ 5
3450:627	Advanced Numerical Analysis I	3	\$ 5
3450:628	Advanced Numerical Analysis II	3	\$ 5
3450:629	Matrix Computations I	3	\$ 5
3450:630	Matrix Computations II	3	\$ 5
3450:635	Optimization	3	\$ 5
3460:501	Fundamentals of Data Structures	3	\$25
3460:506	Introduction to C and UNIX	3	\$25
3460:508	Windows Programming	3	\$25
3460:518	Introduction to Discrete Structures	3	\$15
3460:520	Structured Programming	3	\$20
3460:521	Introduction to Object Oriented Programming	3	\$20
3460:526	Operating Systems	3	\$25
3460:528	UNIX System Programming	3	\$25
3460:530	Theory of Programming Languages	3	\$25
3460:535	Analysis of Algorithms	3	\$15
3460:540	Compiler Design	3	\$25
3460:555	Data Communications and Computer Networks	3	\$25
3460:557	Computer Graphics	3	\$25
3460:560	Artificial Intelligence and Heuristic Programming	3	\$25
3460:565	Computer Organization	3	\$25
3460:567	Microprocessor Programming and Interfacing	3	\$25
3460:570	Automata, Computability, and Formal Languages	3	\$15
3460:575	Data-Base Management	3	\$25
3460:577	Introduction to Parallel Processing	3	\$25
3460:610	Symbolic and Numeric Methods	3	\$20
3460:626	Advanced Operating Systems	3	\$25
3460:635	Advanced Algorithms and Complexity Theory	3	\$25
3460:640	Advanced Compiler Design and Construction	3	\$25
3460:655	Computer Networks and Distributed Processing	3	\$25
3460:657	Advanced Computer Graphics	3	\$25
3460:658	Visualization	3	\$25
3460:660	Expert Systems	3	\$25
3460:665	Advanced Computer Architecture	3	\$25
3460:670	Advanced Automata and Computability	3	\$25
3460:675	Advanced Database Management	3	\$25
3460:677	Parallel Processing	3	\$25
3460:680	Software Engineering	3	\$25
3470:561	Applied Statistics I	4	\$10
3470:562	Applied Statistics II	4	\$10
3470:580	Statistical Computer Applications	3	\$15
3470:663	Experimental Design	3	\$10
3470:665	Regression	3	\$10
3470:666	Nonparametric Statistics-Methods	3	\$10
3470:667	Factor Analysis	3	\$10
3470:668	Multivariate Statistical Methods	3	\$10
3470:675	Response Surface Methodology	3	\$10
3650:551	Advanced Laboratory I	2	\$25
3650:552	Advanced Laboratory II	2	\$25
3650:568	Digital Data Acquisition	3	\$20
3700:540	Survey Research Methods	3	\$10

3700:542	Methods of Policy Analysis	3	\$10
3700:601	Research Methods in Political Science	3	\$10
3750:601	Psych. Resch. Using Quantitative and Computer Methods I	4	\$50
3750:602	Psych. Resch. Using Quantitative and Computer Methods II	4	\$50
3750:754	Research Methods in Psychology	2-4	\$50
3750:755	Computer Applications in Psychological Research	4	\$50
3850:603	Sociological Research Methods	3	\$15
3850:604	Social Research Design	3	\$15
3980:600	Basic Quantitative Research	3	\$15
3980:601	Advanced Research and Statistical Methods	3	\$15
3980:674	Analytical Techniques for Public Administrators	3	\$15

**College of Engineering**

All full-time graduate engineering students will be charged a \$200 fee each fall and spring semester. A prorated (graduate credit hours/9) fee will be charged to all part-time graduate engineering students.

Additional fees are assessed for the following courses:

4300:518	Soil and Rock Exploration	3	\$50
4300:523	Chemistry for Environmental Engineers	3	\$50
4300:568	Highway Materials	3	\$50
4400:555	Microwaves	4	\$50
4400:565	Programmable Logic	3	\$50
4400:572	Control Systems II	4	\$50
4400:584	Power Electronics Laboratory and Design Project	2	\$50
4800:601	Biomedical Instrumentation I	4	\$50
4800:634	Medical Imaging Devices	3	\$50
4800:640	Spine Mechanics	3	\$50
4800:641	Soft Connecting Tissue Biochemistry	3	\$50
4800:642	Hard Connecting Tissue Biochemistry	3	\$50

**College of Education**

5100:512	Design and Production of Instructional Materials	3	\$25
5100:520	Introduction to Computer-Based Education	3	\$25
5100:630	Seminar in Computer-Based Education	3	\$25
5100:741	Statistics in Education	3	\$25
5100:743	Advanced Educational Statistics	2	\$25
5300:525	Advanced Microcomp Applications in Secondary Schools	3	\$20
5300:545	Computer Applications for Secondary Teachers	3	\$35
5400:530	Systematic Curriculum Design for Technical Education	3	\$20
5400:535	Instructional Techniques in Technical Education	4	\$20
5560:550	Application of Outdoor Education to the School Curriculum	4	\$10
5560:552	Resources and Res Mgmt for the Teaching of Outdoor Ed	4	\$10
5560:600	Outdoor Education: Rural Influences	3	\$10
5600:645	Tests and Appraisals in Counseling	4	\$15
5600:647	Career Development and Counseling Across the Life-Span	3	\$15
5600:675	Practicum in Counseling I	5	\$15
5600:676	Practicum in Counseling II	2-5	\$15
5600:702	Advanced Counseling Practicum	4	\$15
5600:712	Principles and Practice of Individual Intelligence Testing	4	\$15
5600:714	Objective Personality Evaluation	4	\$15
5600:720	Topical Seminar: Guidance and Counseling	1-3	\$10
5610:561	Technology and Materials Application in Special Education	3	\$15
5610:563	Assessment in Special Education	3	\$15
5610:565	Neuromotor Aspects of Physical Disabilities	3	\$10
5610:570	Clinical Practicum in Special Education	3	\$15
5620:610	Educational Diagnosis for School Psychologists	4	\$15
5620:611	Practicum in School Psychology	4	\$15
5700:615	Computer Applications in Educational Administration	2	\$25

**College of Business Administration**

All graduate-level courses in the College of Business Administration are assessed a \$5 fee with the exception of the following courses:

6200:588	CPA Problems: Auditing	2	\$3.50
6200:589	CPA Problems: Theory	2	\$3.50
6200:628	Basic Tax Research	1	\$2
6200:643	Tax Accounting	2	\$3.50
6200:644	Income Taxation of Decedents, Estates and Trusts	2	\$3.50
6200:646	Consolidated Tax Returns	2	\$3.50
6200:648	Tax Practice and Procedure	2	\$3.50
6200:649	State and Local Taxation	2	\$3.50
6200:650	Estate Planning	2	\$3.50
6200:651	United States Taxation and Transnational Operations	2	\$3.50
6200:652	Tax Exempt Organizations	2	\$3.50
6200:653	Business Planning	2	\$3.50
6200:656	Non-Qualified Executive Compensation	2	\$3.50
6700:690	Professional Responsibility	1	\$2
6700:692	International Business	1	\$2
6700:694	Applied Business Documentation and Contact	1	\$2
6700:696	Special Topics in Professional Development	1	\$2

**College of Fine and Applied Arts**

(All graduate-level courses in 7520: Applied Music are assessed fees in varying amounts.)

7100:591	Architectural Presentations I	3	\$15
7100:592	Architectural Presentations II	3	\$ 5
7400:503	Advanced Food Preparation	3	\$15
7400:518	History of Furniture and Interiors I	4	\$10
7400:519	History of Furniture and Interiors II	4	\$10
7400:520	Experimental Foods	3	\$20
7400:523	Professional Image Analysis	3	\$12
7400:524	Nutrition in the Life Cycle	3	\$ 5
7400:525	Advanced Textiles	3	\$15
7400:532	Interiors, Textiles, and Product Analysis	3	\$ 5
7400:533	Residential Design	3	\$20
7400:534	Commercial Design	3	\$20
7400:535	Principles and Practices of Interior Design	3	\$10
7400:536	Textile Conservation	3	\$12
7400:537	History of Western Costume to 1800	3	\$10
7400:538	History of Fashion Since 1780	3	\$10
7400:580	Community Nutrition I	3	\$20
7400:581	Community Nutrition I-Clinical	1	\$40
7400:582	Community Nutrition II	3	\$ 5

7400:583	Community Nutrition I-Clinical	1	\$40
7400:588	Practicum in Dietetics	1-3	\$25
7400:603	Family Relationships in Middle and Later Years	3	\$10
7500:553	Music Software Survey and Use	2	\$25
7500:613	Instructional Programming in Music for the Microcomputer	3	\$25
7500:640	Advanced Accompanying I	1	\$3750
7500:641	Advanced Accompanying II	1	\$3750
7500:642	Advanced Accompanying III	1	\$3750
7500:643	Advanced Accompanying IV	1	\$3750
7600:563	Corporate Video Design	3	\$10
7600:564	Corporate Video Management	3	\$10
7600:566	Audio and Video Editing	3	\$15
7600:567	Directing Video Productions	3	\$15
7600:592	Corporate Video Practicum	2-6	\$15
7700:540	Augmentative Communication	3	\$10
7700:641	Amplification	3	\$10
7700:650	Advanced Clinical Practicum: Differential Diagnosis	1	\$10
7700:651	Advanced Clinical Practicum: Voice	1	\$10
7700:652	Advanced Clinical Practicum: Fluency	1	\$10
7700:654	Advanced Clinical Practicum: Diagnostic Audiology	1	\$10
7700:655	Advanced Clinical Practicum: Articulation	1	\$10
7700:656	Advanced Clinical Practicum: Language	1	\$10
7700:657	Advanced Clinical Practicum: Rehabilitation Audiology	1	\$10
7800:600	Introduction to Graduate Studies	3	\$ 5
7800:606	Principles of Modern Scenography	3	\$ 5
7900:590	Dance Workshop	1-3	\$ 5
7920:590	Workshop in Dance	1-3	\$ 5

**College of Nursing**

8200:603	Theoretical Basis for Nursing	3	\$25
8200:605	Computer Applications in Nursing	2	\$25
8200:607	Policy Issues in Nursing	3	\$25
8200:608	Pathophysiological Concepts of Nursing Care	3	\$25
8200:610	Advanced Adult/Gerontological Assessment	0	\$150
8200:613	Nursing Inquiry I	3	\$25
8200:618	Nursing Inquiry II	4-6	\$25
8200:621	Gerontological Nursing I	3	\$50
8200:625	Gerontological Nursing II	4	\$50
8200:627	Gerontological Nursing III	4	\$50
8200:629	Practicum: Gerontological Nursing	3	\$50
8200:630	Resource Management in Nursing Settings	3	\$25
8200:632	Fiscal Management in Nursing Administration	3	\$25
8200:635	Organizational Behavior in Nursing Settings	3	\$25
8200:638	Practicum: Nursing Administration I	5	\$25
8200:639	Practicum: Nursing Administration II	5	\$25
8200:640	Scientific Components of Nurse Anesthesia	3	\$25
8200:641	Pharmacology for Nurse Anesthesia I	3	\$25
8200:643	Principles of Anesthesia I	4	\$75
8200:644	Pharmacology of Nurse Anesthesia II	3	\$25
8200:645	Principles of Anesthesia II	4	\$75
8200:647	Professional Role Seminar	2	\$25
8200:649	Nurse Anesthesia Residency	0	\$400
8200:651	Child and Adolescent Health Nursing I	3	\$50
8200:655	Child and Adolescent Health Nursing II	3	\$50
8200:656	Pharmacology for Child and Adolescent Health Nursing	3	\$25
8200:657	Child and Adolescent Health Nursing III	4	\$50
8200:659	Practicum: Child and Adolescent Health Nursing	3	\$50
8200:661	Liaison-Community Mental Health Nursing I	3	\$50
8200:665	Liaison-Community Mental Health Nursing II	4	\$50
8200:667	Liaison-Community Mental Health Nursing III	4	\$50
8200:669	Practicum: Liaison-Community Mental Health Nursing	3	\$50
8200:671	Adult Health Nursing I	3	\$50
8200:675	Adult Health Nursing II	4	\$50
8200:677	Adult Health Nursing III	4	\$50
8200:679	Practicum: Adult Health Nursing	3	\$50
8200:682	Nursing Curriculum Development	3	\$25
8200:683	Evaluation in Nursing Education	3	\$25
8200:684	Practicum: The Academic Role of the Nursing Educator	6	\$25
8200:699	Thesis Research	1-6	\$25

**Note:** Independent Studies, Workshops and Special Topics courses offered on a rotation basis may include fees not listed here. Consult appropriate department for course material and computing fees for those classes.

**Financial Aid**

Financial aid programs were developed by the federal and state governments as well as by institutions of higher education to assist students from families with limited resources to meet educational expenses. The primary purpose of financial aid is to ensure that no one is denied the opportunity of a college education because of financial need.

When applying for financial aid at The University of Akron, the Office of Student Financial Aid determines a budget that best suits the needs of the student. The budget includes direct costs that must be paid to the University (instructional and general fees and room and board in the residence halls) and variable expenses such as transportation and personal expenses.

To apply for a variety of grants and loans, the student must complete and submit the Free Application for Federal Student Assistance (FAFSA) or the Renewal Application to the Federal Processor. Applications are available in January for the following school year. Inquiries may be directed to the Office of Student Financial Aid, Spicer 119, (330) 972-7032 or (800) 621-3847.

A graduate student who has already received a bachelor's degree can apply for the Federal Subsidized and Unsubsidized Stafford Loan. The Federal Pell Grant, Ohio Instructional Grant and Federal Supplemental Educational Opportunity Grant may not be received. Postbaccalaureate students may only apply for Subsidized and Unsubsidized Stafford Loans.

### Installment Payment Plan

This plan is designed to spread registration and University housing fees into as many as four installments (two during a summer term) depending on when the application is received. An Application Service Charge of \$17 per contract for registration fees and \$17 per contract for University housing fees is assessed for the Installment Payment Plan (IPP). If a payment is not received on the due date, a late payment penalty is assessed at \$20 per payment for registration fees or \$40 per payment if University housing is included. These fees are subject to change.

For applications received up to and including the published semester fee deadline, a 30-percent down payment is required with three follow-up installments at 20 percent, 25 percent and 25 percent respectively. Applications received after the fee deadline and up to the first day of classes will require a 50-percent down payment with two follow-up installments of 25 percent each. For summer terms, the down payment is 30 percent plus one installment at 70 percent or less, depending on the amount of direct application. If the direct application of financial aid for the fall or spring semester is greater than 30 percent and is used as a down payment, the remaining balance will be billed in one, two or three equal payments, depending on when the student registers. Installments are billed monthly starting approximately 30 days after the start of classes.

Financial aid may be used to pay the down payment. If the amount of aid is greater than the required down payment, the entire aid amount must be used as the downpayment. The remaining installment balance will be billed either in two or three equal payments, depending on the registration period.

Application forms are included with the Student Fee Invoice or may be obtained in Spicer Hall 105 or by calling (330) 972-5100.

### Graduate Assistantships

Graduate assistantships may be available through various graduate degree-granting academic units. Graduate assistantships and other graduate awards are distributed to the colleges through the Graduate School; therefore, a separate application is required. For further information, contact the Graduate School, Polsky Building, room 469, (330) 972-7663.

### International Students

An international student in the United States on a student or other temporary visa is not eligible for any state or federal financial aid. Application for scholarships, short-term loans, graduate assistantships, and some types of employment may be made.

## Regulations Regarding Refunds

All fees, e.g., instructional, general, parking, etc., are subject to change without notice. Students shall be charged fees and/or tuition and other fees in accordance with schedules adopted by the Board of Trustees. Registration does not automatically carry with it the right of a refund or reduction of indebtedness in cases of failure or inability to attend class or in cases of withdrawal. The student assumes the risk of all changes in business or personal affairs.

### Fees Subject to Refund

Certain fees are subject to refund.

- Instructional fee (tuition) and nonresident surcharge.
- General fee.
- Course materials and computing fee.
- Student parking fee (only if permit is returned).
- Student teaching fee.
- Laboratory breakage and late service deposit.
- Residence hall fees (note: subject to special policy).

### Amount of Refund

Amount of refund is to be determined in accordance with the following regulations and subject to course instructor/adviser signature requirements contained in the University's official withdrawal policy:

- **In full**
  - if the University cancels the course;
  - if the University does not permit the student to enroll or continue in the course;

- if the student dies before or during the term; is drafted into military service by the United States; is called to active duty; or if the student enlists in the National Guard or Reserve prior to the beginning of the term. Notice of induction or orders to active duty is required if the student is called to active duty. A student who enlists voluntarily for active duty should see "in part" below.

- **In part**

- less \$5 per enrolled credit to a maximum of \$50 if the student requests official withdrawal from all credit courses on or before the Sunday (midnight) which begins the second week of the enrolled term. (Note: If a semester begins other than on a Monday, the maximum refund period will extend to seven (7) days from the beginning of the semester. Example: semester begins on Tuesday, the maximum refund period will end at midnight on the following Monday.)

- if the student requests official withdrawal after the Sunday (Midnight) which begins the second week of the fall or spring semesters, the following refund percentages apply:

During the second week of the semester	70%
During the third week of the semester	50%
During the fourth week of the semester	30%
During the fifth week of the semester	20%
Thereafter	0%

- if the student requests official withdrawal after the Sunday (midnight) which begins the second week of the semester of any Summer Session the following refund percentages apply:

During the second week of the summer session	40%
Thereafter	0%

- Refunds for course sections which have not been scheduled consistent with either the standard 15-week fall/spring semester or the five-week summer term scheduling pattern will be handled on a *pro rata* basis according to the number of days of the section (class, institute, or workshop) which have passed compared to the number of days said section has been scheduled to meet.

- Refunds will be determined as of the date of formal withdrawal unless proof is submitted that circumstances beyond control of the student, e.g., hospital confinement, prevented the filing of the formal withdrawal earlier, in which case the refund will be determined as of said circumstance. The student assumes responsibility for filing for a refund.

- Refunds will be mailed as soon as possible. Refund checks are subject to deduction for any amount owed to The University of Akron by the student.

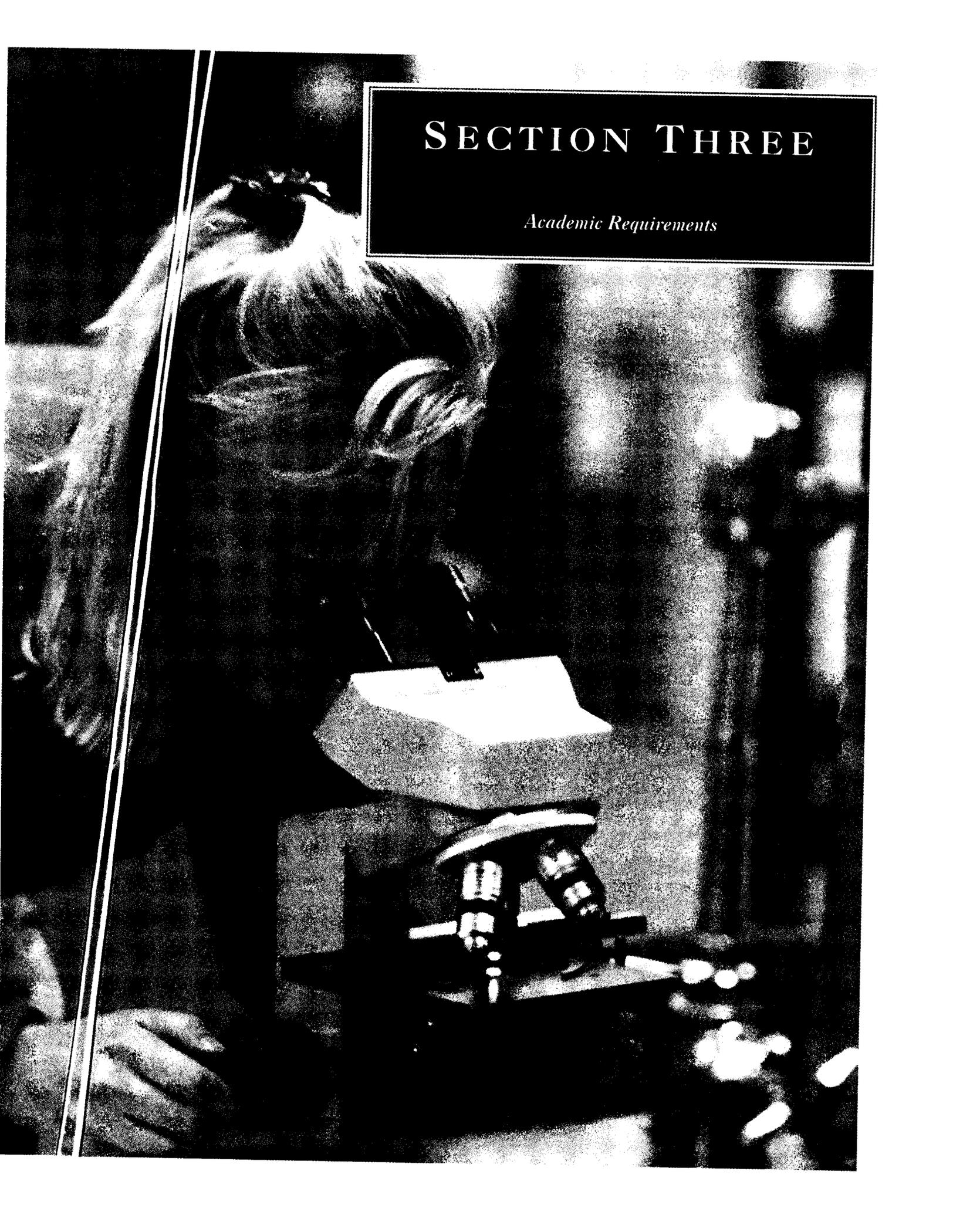
- No refund will be granted to a student who is dismissed or suspended for disciplinary reasons.

### Refund for Cancelled Classes

The University reserves the right to cancel a course should there be insufficient enrollment. A full refund will be mailed to the student as soon as possible.

# SECTION THREE

*Academic Requirements*



# Academic Requirements

## MASTER'S DEGREE REQUIREMENTS

### Admission

When a student is admitted to graduate study, an adviser is appointed by the head of the major department. A student who is academically qualified in general but deficient in course preparation may be required to make up the deficiencies at the postbaccalaureate level. This may be recommended prior to beginning graduate work, or in some cases, can be done simultaneously.

### Residence Requirements

There are no formal residence requirements for the master's degree. A student may meet the degree requirements of the Graduate School and the department through either full- or part-time study.

### Continuous Enrollment Requirements

There is no formal Graduate School continuous enrollment requirement for the master's degree. Individual master's programs, however, may require continuous enrollment. Students should consult their advisers about this requirement.

### Time Limit

All requirements must be completed within six years after beginning graduate-level coursework at The University of Akron or elsewhere. Extension by up to one year may be granted in unusual circumstances by the dean of the Graduate School upon written request by the student and recommendation by the adviser and department head.

### Credits

A minimum of 30 semester credits of graduate work is required in all master's degree programs. This includes thesis credit. Some departments require more (see departmental requirements). A minimum of two-thirds of the total graduate credits required in any master's program must be completed at the University. A maximum of six workshop credits may be applied to a master's degree. Such credits must be relevant to the degree program, recommended by the student's adviser and approved by the dean of the Graduate School.

It should be noted that the requirements listed by department elsewhere in this section refer to the minimum necessary for a degree. It is entirely within the prerogative of the department to assign additional credits of coursework or other requirements in the interest of graduating a fully qualified student.

No graduate credit may be received for courses taken by examination or for 500-numbered courses previously taken at the 400-number course level as an undergraduate without advance approval from the dean of the Graduate School. "Repeat for change of grade" is not available at the graduate level.

### Transfer Credits

Up to one-third of the total credits required for a master's degree may be transferred from an accredited college or university. Departments and colleges may set more restrictive limits. All transfer credit must be at the "A" or "B" level in graduate courses. The credits must be relevant to the student's program as determined by the student's academic department, and must fall within the six-year time limit to complete degree requirements.

Credits transferred may come from a prior degree. Up to one third of credits from a prior or concurrent graduate degree at The University of Akron may be used to satisfy the requirements of a concurrent or subsequent master's degree. A University of Akron student who seeks to enroll in courses elsewhere for transfer credit here must receive prior approval.

A student seeking to transfer credit must have full admission and be in good standing at The University of Akron and at the school at which the credits were earned. Transfer credit shall not be recorded until a student has completed 12 semester credits at The University of Akron with a grade-point average of 3.00 or better. Transfer credits from other institutions shall not be computed as part of a student's University of Akron grade point average.

## Optional Department Requirements

Each department may set special requirements with regard to entrance examinations, qualifying examinations, foreign language, required courses and thesis. Details are available from the head of the major department.

## Advancement to Candidacy

A student should apply for advancement to candidacy after completion of one-half of the credits required for the degree in his or her program. A student must be fully admitted and in good standing to be advanced to candidacy.

Advancement to Candidacy forms must be submitted no later than May 15 for the January commencement and no later than September 15 for the May commencement. These forms are available in the office of the Dean of the Graduate School or in the academic department.

## Graduation

To be cleared for graduation, a candidate must have completed coursework with a minimum average of 3.00; been advanced to candidacy; filed an application for graduation with the registrar; paid all applicable fees; and met any other department and University requirements applicable.

If a thesis is required, two copies, properly prepared, are due in the Graduate School at least three weeks prior to commencement. These copies must be signed by the adviser, faculty reader, department head and college dean prior to submission to the dean of the Graduate School. A manual entitled *Preparing a Thesis or Dissertation* is available in the Graduate School and all copies of the thesis must conform to these instructions.

## DOCTORAL DEGREE REQUIREMENTS\*

A master's degree is not a prerequisite for the doctorate; however, the first year of study after the baccalaureate will be substantially the same for both the master's and doctoral student. Some programs admit students to doctoral programs directly after the bachelor's degree; others require a master's degree. No specific number or sequence of courses constitutes a doctoral program or assures attainment of the degree. A formal degree program consists of a combination of courses, seminars and individual study and research that meet the minimum requirements of the Graduate School and those of the committee for each individual student.

### Admission

Usually, a student is not officially considered as a doctoral student until completion of a master's program or its equivalent and approval for further study. Departments offering doctoral degree programs review each candidate carefully before recommending admission.

A minimum grade-point average of 3.00 is required for graduation of a candidate for all doctoral degrees.

### Residence Requirements

A doctoral student may meet the degree requirements of the Graduate School and department by full-time study or a combination of full- and part-time study.

The minimum residence requirement for a doctoral candidate in all programs is at least two consecutive semesters of full-time study and involvement in departmental activities. Full-time study is defined as 9-15 semester credits, except for graduate teaching and research assistants for whom full-time study is specified by the assistantship agreements. The summer sessions may count as one semester, provided that the candidate is enrolled for a minimum of 10 consecutive weeks of full-time study and for a minimum of six semester credits per five-week session. Individual programs may have additional residence requirements such as credits or courses to be completed, proper time to fulfill the residence requirement, and the extent to which a resident may hold outside employment.

Before a doctoral student begins residency, the student's adviser and the student shall prepare a statement indicating the manner in which the residence requirement will be met. Any special conditions must be detailed and will require the approval of the student's committee, the department faculty member approved to direct doctoral dissertations, the collegiate dean and the dean of the Graduate School.

\*The doctoral program in engineering is an interdisciplinary program offered on a collegiate basis. In the descriptions of University doctoral degree requirements on the following pages, citations of department or departmental faculty should be interpreted as citations of college or collegiate faculty with specific reference to the doctoral program in engineering.

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## Continuous Enrollment Requirement

All students admitted to doctoral programs must register for a minimum of one graduate credit as approved by their advisers during each Fall and Spring semester. Individual departments may exceed this minimum requirement. Doctoral students shall consult their advisers about additional requirements. Master's programs may require continuing enrollment. Students should consult their advisers about this requirement.

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## Time Limit

All doctoral requirements must be completed within 10 years of starting coursework at The University of Akron or elsewhere. This refers to graduate work after receipt of a master's degree or the completion of 30 semester credits. Extensions of up to one year may be granted by the dean of the Graduate School under unusual circumstances.

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## Credits

A doctorate is conferred in recognition of high attainment and productive scholarship in some special field of learning as evidenced by the satisfactory completion of a prescribed program of study and research; and the successful passing of examinations covering the special field of study and the general field of which this subject is a part. Consequently, the emphasis is on mastery of the subject rather than a set number of credits. Doctoral programs generally encompass the equivalent of at least three years of full-time study at the graduate level. A minimum of 50 percent of the total credits above the baccalaureate required in each student's doctoral program must be completed at the University. A maximum of six workshop credits may be applied to a doctoral degree. Such credits must be relevant to the degree program, recommended by the student's adviser and approved by the dean of the Graduate School.

No graduate credit may be received for courses taken by examination or for 400-numbered courses previously taken at the 400-number course level as an undergraduate without advance approval from the dean of the Graduate School. "Repeat for change of grade" is not available at the graduate level.

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## Transfer Credits

Up to 50 percent of the total credits above the baccalaureate required in a doctoral program may be transferred from accredited colleges or universities. Departments and colleges may set more restrictive limits. The credits must be relevant to the student's academic program as determined by the student's academic department and must fall within the 10-year limited to complete degree requirements if beyond the master's degree. All credits transferred must be at the "A" or "B" level in graduate courses.

Credits transferred may come from a prior degree. No more than thirty semester credits may be transferred from a single master's degree. Credits earned in prior or concurrent programs at The University of Akron shall be treated in the same manner as credits earned elsewhere. A University of Akron student who seeks to enroll in courses elsewhere for transfer credit here must receive prior approval.

A student seeking transfer credit must have full admission and be in good standing at The University of Akron and at the school at which the credits were earned. Transfer credit shall not be recorded until a student has completed 12 semester credits at The University of Akron with a grade-point average of 3.00 or better. Transfer credits from other institutions shall not be computed as part of a student's University of Akron grade point average.

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## Language Requirements

There is no University-wide foreign language requirement for the Ph.D. The student is required to demonstrate one of the following skills depending upon the particular program.

- Plan A: Reading knowledge, with the aid of a dictionary, of two approved foreign languages. At the discretion of the major department an average of "B" in the second year of a college-level course in a language will be accepted as evidence of proficiency in reading knowledge for that language. English may be considered as one of the approved foreign languages for a student whose first language is not English; and demonstrated competence in research technique (e.g., statistics and/or computers) may be substituted for one of the two foreign languages. Under the last option, each department should define competence and publicize.
- Plan B: Comprehensive knowledge of one approved foreign language, including reading without the aid of a dictionary and such additional requirements as the department may impose.
- Plan C: In certain doctoral programs (counseling and guidance, elementary education, engineering, psychology, secondary education, urban studies) the demonstration of competence in appropriate research skills may serve as a substitute for the foreign language requirements.

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## Optional Department Requirements

Each department may determine requirements for a doctoral student with regard to entrance examinations, qualifying examinations, preliminary or comprehensive examinations and course sequences.

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## Advancement to Candidacy

A student should apply for advancement to candidacy after completion of one-half of the credits required for the degree in his or her program. A student must be fully admitted and in good standing to be advanced to candidacy.

Advancement to Candidacy forms must be submitted no later than May 15 for the January commencement and no later than September 15 for the May commencement. These forms are available in the office of the dean of the Graduate School or in the academic department.

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## Dissertation and Oral Defense

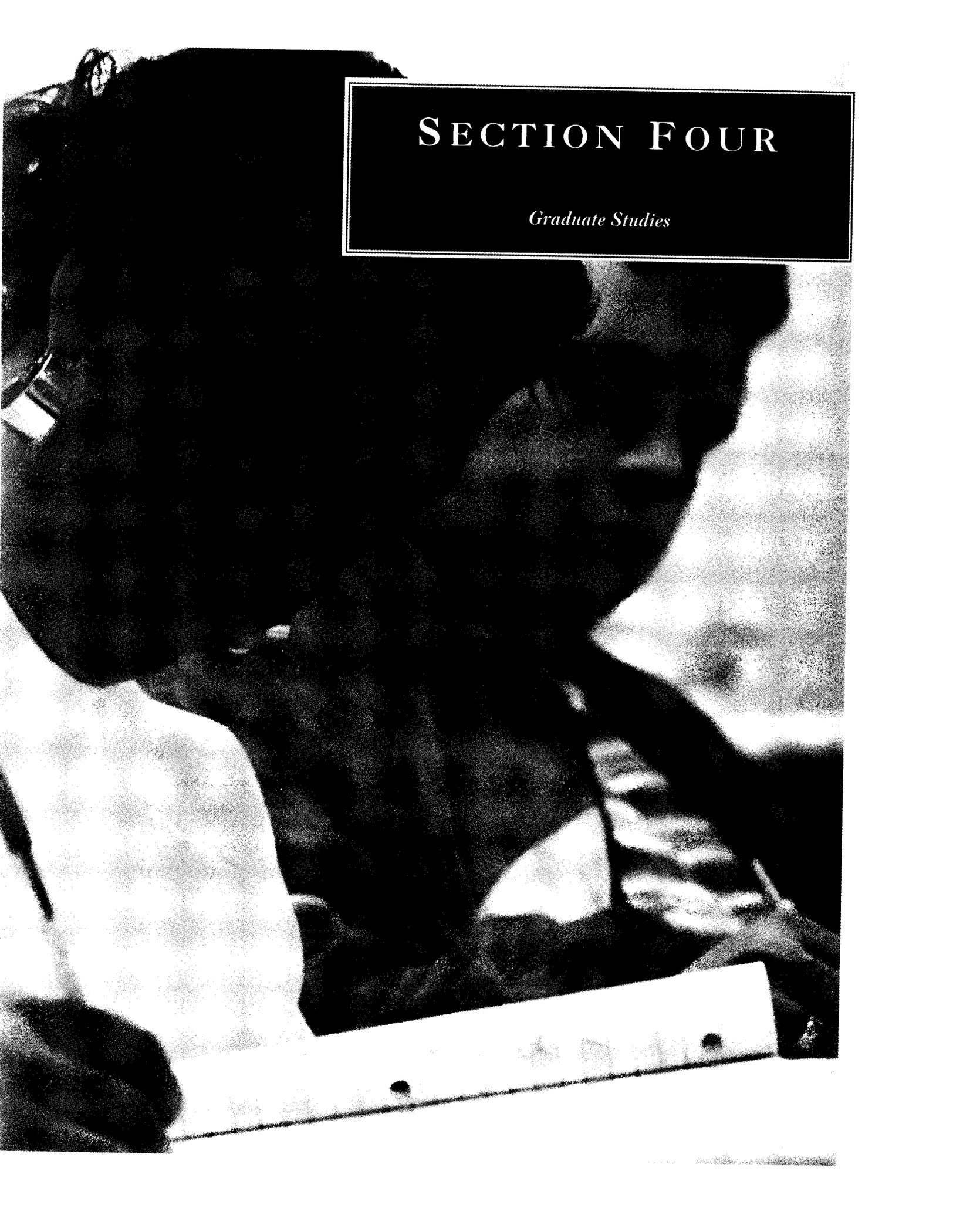
The ability to do independent research and demonstrate competence in scholarly exposition must be demonstrated by the preparation of a dissertation on some topic related to the major subject. It should represent a significant contribution to knowledge, be presented in a scholarly manner, reveal the candidate's ability to do independent research and indicate experience in research techniques.

A doctoral dissertation committee supervises and approves the dissertation and administers an oral examination upon the dissertation and related areas of study. This examination is open to the graduate faculty. The dissertation and oral examination must be approved by the committee before the dissertation is submitted to the Graduate School. Two copies of the dissertation are due in the Graduate School at least three weeks prior to commencement. These copies must be signed by the adviser, department head and college dean prior to submission to the dean of the Graduate School. A manual titled *Guidelines for Preparing a Thesis or Dissertation* is available in the Graduate School and all copies of the dissertation must conform to these instructions.

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## Graduation

To be cleared for graduation, a candidate must have completed the academic program with a grade-point average of at least 3.00; been advanced to candidacy; submitted an approved dissertation and passed an oral examination; filed an application for graduation with the registrar; paid all applicable fees; and met any other department and University requirements.



# SECTION FOUR

*Graduate Studies*

# Buchtel College of Arts and Sciences

Roger B. Creel, Ph.D., *Dean*

David C. Buchthal, Ph.D., *Associate Dean*

William A. Francis, Ph.D., *Associate Dean*

## Mission Statement

The Buchtel College of Arts and Sciences serves the objectives of the University, which state that learning may be procured, preserved and enlarged. More particularly, the college seeks to foster:

The commitment to humanity—that loyal devotion to the heritage contained in those disciplines growing out of the ancient liberal arts which teach limitations and potentialities. The college seeks to provide an appropriate environment for students to acquire an ability to evaluate, integrate and understand the conditions of human existence, to understand themselves in the natural world and in a particular civilization or society. No course or combination of courses can ensure such understanding, there is no schooling that can guarantee wisdom. Therefore, the college requires the student to study ideas and experiences that are the subject matter of a variety of disciplines:

the nurture of civility—those actions whereby virtue, the advancement of society, and wise and humane government are encouraged;

the advancement of learning—that substantive knowledge discovered and cultivated by critical curiosity, tested by experimentation, propagated by instruction and capable of affecting lives so that all may in a free society exercise responsible liberty. The most enduring contribution which the college can make is to help individuals acquire the skill, motivation and breadth of knowledge to continue their intellectual development throughout their lives.

The college recommends each student for the appropriate bachelor's, master's or doctoral degrees in accordance with the level of accomplishment.

Buchtel College is one of 10 degree-granting college at The University. Its name truthfully implies that its traditions date back farther than those of the undergraduate colleges, since the University itself is an outgrowth of Buchtel College, a liberal arts institution founded in 1870.

When Buchtel College became the Municipal University of Akron, the original name was retained in the College of Liberal Arts which was subsequently renamed the Buchtel College of Arts and Sciences. Then, and now, the liberal arts goal has been to offer broad training to the college student so that the student can prosper in life and sustain a creative appreciation of the arts and sciences.

The college is composed of the following three administrative divisions: Humanities (English, modern languages), Natural Sciences (biology, chemistry, geology, mathematical sciences, and physics), and Social Sciences (economics, geography and planning, history, political science, public administration and urban studies, psychology, sociology).

## DOCTOR OF PHILOSOPHY DEGREE

The following programs leading to the Doctor of Philosophy degrees are offered in the Buchtel College of Arts and Sciences: the Doctor of Philosophy in Chemistry, the Doctor of Philosophy in Counseling Psychology, the Doctor of Philosophy in History, and the Doctor of Philosophy in Psychology. The Doctor of Philosophy in Sociology is offered jointly with Kent State University and the Doctor of Philosophy in Urban Studies with Cleveland State University.

### Doctor of Philosophy in Chemistry

The Doctor of Philosophy in Chemistry is granted for high scholarly achievement in analytical, inorganic, organic, physical or biochemistry. Students with either a baccalaureate or master's degree may be admitted to the program. They must satisfy the following requirements to receive the degree:

- Complete a course of study designed in consultation with an adviser or advisory committee. This consists of the completion of at least 90 credits beyond the baccalaureate degree, including 24 credits of appropriate coursework.
- Complete monthly cumulative exam requirement.
- Complete oral exam requirement.

- Complete seminar requirement.
- Defend dissertation in an oral examination.
- Complete all general requirements for the doctor of philosophy degree.

### Doctor of Philosophy in Counseling Psychology

The University of Akron offers a doctoral program in Counseling Psychology. The program allows the student a choice of entry points through the Psychology Department of the Buchtel College of Arts and Sciences or through the Counseling and Special Education Department of the College of Education. Students in both departments are expected to attain a level of broad scientific competence in the core areas of psychology; the biological, social, cognitive-affective, and individual bases of human behavior. Practicum and internship experiences are also required of all students and range from skill building in basic psychological assessment and counseling, to actual work with clients, to a year-long, full-time internship in an applied service setting. Pertinent information regarding the emphasis, orientation, and coursework for the Psychology Department entry is included below. Students receive exposure to both colleges through shared coursework and faculty involvement with dissertations. The Collaborative Program in Counseling Psychology is accredited by the American Psychological Association.

The Department of Psychology offers a five-year Counseling Psychology program leading to a doctoral degree and, in general, is geared toward students who hold a B.A. in psychology. Program emphasis is strongly placed on a scientist-practitioner model of training. Beyond the basic core areas of psychology, students are expected to establish specific competencies in the areas of theory, research, and practice of Counseling Psychology. Academic preparation includes theories of individual and group psychotherapy, supervision, diversity issues in counseling psychology, vocational development theory, testing theory and practice, research and statistics, and professional issues. Research and publication are greatly encouraged. Graduates typically seek out academic teaching, research and training positions, as well as positions in counseling centers and other mental health agencies.

Admission to the Collaborative Program in Counseling Psychology is handled through the department associated with the student's chosen entry point. Students must fulfill both Departmental and Graduate School admission requirements. Departures from the described program for Psychology Department entry may be made only with the approval of the counseling psychology program faculty.

### Requirements

The curriculum reflects the interdepartmental blend of the Collaborative Program in Counseling Psychology. Electives and other classes are to be planned along with the student's adviser.

	Credits
– Psychology core courses (610, 620, 630, 640, 650)	10
– Counseling psychology core courses (707, 710, 711, 712, 713, 714, 715, 717, 718, 780)	34
– Practicum sequence (671, 672, 673, 795 [4+4], 796 [4+4])	26
– Advanced Psychological Tests and Measures (750)	4
– Electives (minimum)	6
– Statistics (601, 602)	8
– A statistics sequence that may be substituted for the doctoral language requirement	8
– Thesis credits (minimum)	1
– Dissertation credits (minimum)	12

- The comprehensive written examination is prepared, administered and graded by program faculty. At least one faculty member from each department participates in the oral portion of the comprehensive examination.
- Dissertation – at least one faculty member from each department is required on the student's dissertation committee.
- Internship – 2,000 hours postmaster's with 1,600 hours over no more than two years. The internship site must be approved in advance by the Collaborative Program Internship Committee.
- Students must maintain a 3.50 GPA in their content courses each year in the Department of Psychology.

### Doctor of Philosophy in History

The Doctor of Philosophy in History is granted primarily for high scholarly achievement in four fields of study selected by the student and for demonstrated ability to pursue independent research. Each student must:

- Fulfill admission requirements of the School.

The Graduate Committee of the History Department will consider an applicant for admission if a person has a Master's degree or the equivalent and a grade-point average of 3.3 or better at the M.A. level from an accredited institution. Those holding a Master's degree from The University of Akron or other accredited institution should not assume that they will automatically be admitted to doctoral studies. In

addition to the application made to the Graduate School of The University of Akron, the student must submit to the History Department the following materials:

- a personal statement of reasons for wishing to undertake doctoral study and the fields of study the student wishes to pursue;
- three letters of recommendation from former professors;
- a writing sample, preferably a seminar paper or other comparable scholarly work;
- scores on the Graduate Record Examination, General Aptitude Test;
- evidence of a reading knowledge of one foreign language or knowledge of an acceptable cognate field. Those whose native language is not English must demonstrate proficiency in English.

The History Department does not encourage applications for the doctoral program from students who have received both B.A. and M.A. degrees from The University of Akron. Special circumstances may warrant consideration, however, and the Graduate Committee reserves the right to judge applications on their own merit.

- Complete studies selected by the student in consultation with an advisory committee, including:
  - completion of 60 credits beyond master's degree requirements, including dissertation credit. Courses at the 500-level in the student's major and dissertation fields will not be counted toward the degree, and only 9 hours of 500-level courses in the student's secondary fields will be counted;
  - demonstration of competency in four fields of study selected from the following areas: ancient, medieval, modern Europe to 1750, modern Europe since 1750, England and the Empire, United States 1607 to present, Latin America, Far East, and history of science. Further, students will be required to sit for examinations in three fields chosen from the above list. They will be examined in a fourth field as well, a specialty or sub-topic falling within one of the general fields listed above. The fourth field will be designed by the student and the student's adviser, in consultation with the student's doctoral committee and the Graduate Committee of the History Department. The student's dissertation will fall within this fourth field;
  - satisfactory performance in written and oral comprehensive examinations;
  - defense of the dissertation in an oral examination.
- A reading knowledge of two languages will be required. With the approval of the student's doctoral committee and the Graduate Committee, the student may substitute a cognate field for one of the two required languages when it seems appropriate for the student's general program.
- Complete all general requirements for the Doctor of Philosophy degree.

## Doctor of Philosophy in Psychology

The Department of Psychology offers a doctoral degree in psychology with specialization in either industrial/organizational psychology or applied cognitive aging psychology.

A degree will be awarded to a student who, besides fulfilling the general requirements, has met the following specific requirements:

- Fulfill admission requirements of the Graduate School and department requirements as follows:
  - completion of master's degree including 30 graduate credits;
  - completion of master's core courses or equivalent;
  - attainment of a graduate grade-point average (GPA) or 3.25;
  - completion of Graduate Record Examination Aptitude and Advanced Psychology Test;
  - securing of three letters of recommendation;
- Major field:
  - a minimum of 90 graduate credits including a 30-credit master's program. A student may be required to complete additional credits beyond the 90 minimum credit requirement;
  - completion of Ph.D. core courses in the student's specialty area: industrial/organizational or applied cognitive aging. Core courses are specified in the *Department of Psychology Graduate Student Manual*. The student is required to maintain at least a 3.5 GPA in core courses and overall courses;
  - completion of additional required and elective courses to be planned in conjunction with the student's faculty adviser and subject to approval by the industrial/organizational or applied cognitive aging committees.
- Written comprehensive examinations:
  - satisfactory performance on doctoral written and oral comprehensive examinations in the student's major area of industrial/organizational psychology or applied cognitive aging (refer to the department's graduate student manual).
- Dissertation research:
  - completion of 3750:899 *Doctoral Dissertation*; (minimum 12 credits);

- satisfactory performance on final examination and defense of dissertation research.
- Other requirements:
  - refer to the department's graduate student manual for other requirements or guidelines;
  - complete and fulfill general doctoral degree requirements of the Graduate School.

Doctoral language requirements or appropriate alternative research skills and techniques may be prescribed by the student's advisory committee, depending upon the career plans of the student and upon the academic and/or scientific requirements of the dissertation.

## Doctor of Philosophy in Sociology Akron-Kent Joint Ph.D. Program

The University of Akron and Kent State University departments of sociology offer a joint program leading to the Ph.D. degree. Faculty and student engaged in the joint doctoral program are for all intents and purposes involved in a single graduate program. Course work is offered at both campuses and faculty and students interchange freely.

### Admission to the Program

A student may apply with a completed master's degree or equivalent or after at least one year of full-time coursework or equivalent (18 credits) in the sociology master of arts program at The University of Akron. The coursework must include the master of arts core sequence. Scores from the Graduate Record Examination (GRE) are required as part of the doctoral application. Admission is limited to students whose records clearly indicate both scholarly and research potential.

### Degree Requirements (for a student admitted with the master's degree or equivalent)

In addition to meeting the general requirements of the Graduate School, a student working toward the Doctor of Philosophy in Sociology must meet the following requirements:

- Take the two following courses, such courses not to count toward meeting specialization requirements:
 

3850:631	Social Psychology
3850:645	Social Organization
- Take two doctoral-level courses in theory. These courses are to be selected from the predetermined group of courses (see *Department of Sociology Graduate Student Handbook*).
- Complete two doctoral-level courses in methods/statistics. These courses are to be selected from the predetermined group of courses (see the department's graduate student handbook).
- Complete a specialty of at least 15 credits.
- Complete a minimum total of 30 credits in coursework.
- Pass the doctoral comprehensive examination. This examination is given in the specialty area and will include an evaluation of methods, theory, and statistics as relevant to the specialty area.
- Full residency requirement of the Graduate School.
- Complete foreign language requirement by one of four sequences as detailed in the department's graduate student handbook:
  - foreign language;
  - computer science;
  - statistics;
  - philosophy.
- Register for a minimum of 30 credits of dissertation credit, complete a dissertation and successfully defend it in an oral examination.

### Degree Requirements (for a student admitted without the master's degree)

In addition to meeting the requirements for a student admitted with the master's degree, the student must meet the following requirements:

- Completion of the M.A. core coursework.
- Completion of a research practicum (three credits). This may be waived for the student who already has sufficient research experience.
- Completion of a minimum of 60 credits of graduate-level (600 or higher) coursework beyond the bachelor's degree.

## Doctor of Philosophy in Urban Studies

The Department of Public Administration and Urban Studies of The University of Akron offers a program leading to the Ph.D. in Urban Studies (joint with Cleveland State University). Students admitted to the program may take courses at either campus and all doctoral committees contain members from both universities.

The program is designed to train professionals interested in the areas of policy analysis and evaluation, public administration, and urban and regional planning for university and professional appointments.

### Admission

Admission to the Ph.D. Program involves faculty consideration of all of the following criteria which, taken together, present evidence of the likelihood of success in advanced study:

- Grade point average from previous Master's Degree Program. Students will normally not be admitted with a GPA below 3.5. Having a 3.5 GPA, however, is not sufficient, in itself, for admission.
- Graduate Record Examination General Test Scores. The applicant is expected to submit a score on both the verbal and quantitative portions of the GRE.
- Three letters of recommendation from persons familiar with the applicant's recent performance and abilities.
- A sample of the student's written work. Generally, this should be a thesis or final project paper from the Master's Program. Students who did not have such a requirement in the Master's Program are free to submit several samples of written work – for example, term papers, professional reports, published articles.
- A personal statement from the applicant detailing area of intended specialization and career aspirations (form available in application packet). A student will be considered for admission only if faculty resources are available in the student's indicated area of specialization.
- Those whose native tongue is not English must also demonstrate proficiency in the English Language by scoring a minimum of 570 on the Test of English as Foreign Language (TOEFL) and submitting an acceptable score from the Test of Written English (TWE) and a minimum score of 220 on the Test of Spoken English (TSE).

A student may be required to appear before the Doctoral Committee before a decision is made on admission to the Program.

Entering students will also have successfully completed the following Master's level social science prerequisites (or equivalents) before formal admission:

3980:600	Basic Analytical Research	3
3980:601	Advanced Research and Statistical Methods	3
3980:611	Introduction to the Profession of Public Administration	3
	or	
3350:630	Introduction to Planning Theory	3
3980:640	Fiscal Analysis	3
3980:643	Introduction to Public Policy	3

The Doctoral Committee may also require an applicant to take an admission examination, either written or oral, or both. A student may be admitted to the doctoral program subject to completing graduate-level bridge-up coursework designed to make up deficiencies in previous coursework. Bridge-up coursework will not count toward doctoral degree course requirements.

### Degree Requirements

The Ph.D. Program in Urban Studies has a required core of four courses consisting of two courses in advanced quantitative methods and two courses in urban theory. In addition, students must complete a major consisting of 24 credit hours (eight courses); and a minor consisting of 12 credits (four courses). The major must be taken from one of the following specializations: Policy Analysis and Evaluation, Public Administration, and Urban and Regional Planning. The minor consists of an integrated set of courses offering a specialization in either a set of methodological tools such as advanced statistics, a body of theory, or an area of application such as health policy.

The doctoral major and minor can be completed through a combination of required courses, elective courses, and tutorials. The tutorials allow students to work in close cooperation with an individual faculty member to pursue research interests shared by the student and the faculty member.

Students must pass written and oral comprehensive examinations on the quantitative core courses and on their major area of specialization.

A minimum of 63 credits beyond the master's degree is required, 48 hours of coursework, and 15 hours of dissertation.

## MASTER'S DEGREE

Programs of advanced study leading to the master's degree are offered by the departments of biology, chemistry, economics, English, geography, geology (earth science), history, mathematical sciences, modern languages (Spanish), physics, political science, psychology, sociology, and urban studies. Before undertaking such a program, the student must show that the general requirements for admission to the Graduate School have been met, and the standard requirements for an undergraduate major in the area of the proposed graduate specialty have been met or that the student has performed work which the department approves as equivalent to an undergraduate major.

### Biology

#### Admission Requirements

- Possess the equivalent of a biology undergraduate major with a GPA of 3.00 or higher in biology courses.
- Submit three letters of recommendation.
- Submit scores for Graduate Record Examination (Aptitude and Advanced Biology Tests).
- Submit a letter of proposed area of specialization within biology.
- Non-active speakers of English must submit a TSE score of 220 or above (minimum score of 50 on TSE, revised 1995) to be considered for a graduate assistantship.

### Master of Science

#### Thesis Option I

The program is primarily for the student who will pursue a research career, including the student who intends to enter a doctoral program in the biological sciences.

- Course work in addition to the master's research and seminars (must be approved by the student's advisory committee) – 24 credits.
- Research and thesis – minimum of 12 credits.
- Participation in seminars – a maximum of four credits.
- The student's advisory committee may require the demonstration of reading proficiency in a foreign language appropriate to the field of study.

A minor may be taken in approved graduate courses including education. Summer study at a biological station is available.

#### Thesis Option II

This program is intended for Medical Doctors and Doctors of Osteopathic Medicine who have graduated from an accredited U.S. medical school.

- Course work in addition to the master's research and seminars (must be approved by the graduate officer) – 16 credits (no transfer credits are allowed for this option).
- Research and thesis – minimum of 12 credits.
- Participation in seminars – a maximum of two credits.

#### Nonthesis Option

This program is designed exclusively for secondary school teachers for whom the M.S. probably will be a terminal degree and who do not need research experience. The program is open only to applicants possessing a teaching certificate or those coregistering with the College of Education and showing normal progress towards qualifying for a certificate.

The requirements are the same as the research option except that no thesis and research is undertaken, but a total of 40 credits of approved coursework (including a maximum of four credits for seminar participation) is required.

For additional details concerning admission standards, degree requirements and selection of options, refer to the *Department of Biology Graduate Student Guide*.

### Chemistry

#### Master of Science

- Chemistry coursework – with the approval of the adviser, up to 12 credits may be taken in related areas – 24 credits.
- Research and thesis – six credits.
- Participation in departmental seminars.
- Demonstration of reading proficiency in a foreign language appropriate to the field of study prior to the last semester of enrollment.

## Economics

### Master of Arts

#### Thesis Option

A minimum of 30 credits of coursework including a thesis equivalent to six credits is required. At least 21 credits must be at the 600 level in economics. Thesis must be written in an area of specialization in which the individual has at least two courses.

#### Nonthesis Option

A minimum of 30 credits of coursework is required. At least 21 credits must be at the 600 level in economics. The individual must also specialize in an area.

Required Courses for both options:

3250:602	Macroeconomic Analysis I	3
3259:611	Microeconomic Theory I	3
3250:620	Applications of Mathematical Models to Economics*	3
3250:626	Statistics for Econometrics*	3

Areas of Specialization:

- Economic Development and Planning
- Economic Theory and Policy
- Industrial Organization and Public Policy
- International Economics
- Labor and Industrial Relations
- Quantitative Methods

Exceptional departures from these requirements may be approved with the permission of the graduate faculty and department head. Courses taken outside the department must be approved (in writing) by the student's adviser prior to enrollment.

\*These courses may be waived for the student who can demonstrate, in a qualifying exam, an adequate preparation in mathematics and statistics.

## English

### Master of Arts

#### Thesis Option

A minimum of 33 credits is required (27 credits of coursework and 6 credits of thesis). Of the 27 credits of coursework, 18 must be at the 600 level and 12 must be in literature or literary theory (exclusive of individual reading).

#### Nonthesis Option

A minimum of 36 credits is required, of which 24 must be at the 600 level and 24 must be in literature or literary theory (exclusive of individual reading).

#### Required Courses for Both Options

3300:506	Chaucer†
3300:570	History of the English Language†
	or
3300:670	Modern Linguistics†
3300:615	Shakespearean Drama†
3300:691	Bibliography and Literary Research

### Alternate Track in Composition

Alternate Track in Composition is intended for students interested in the teaching of English in secondary schools and in the teaching of writing and literature at two-year and four-year colleges. The degree is also appropriate for those planning to enter a doctoral program in composition and rhetoric. The program does not lead to state certification for teaching; students should consult the Department of Secondary Education for requirements for state certification to teach in the public schools.

#### Thesis Option

A minimum of 33 credits is required (27 credits of coursework and 6 hours of thesis). Of the 27 credits of coursework, 18 must be in composition studies (including courses in composition, linguistics, and rhetoric) and 9 credits in literature or literary theory (exclusive of individual reading). Of the 27 credits of coursework, 15 must be at the 600 level.

#### Nonthesis Option

A minimum of 36 credits is required, only 6 of which may be individual reading. At least 24 credits required in composition studies (including courses in composition, linguistics, and rhetoric) and 9 credits in literature or literary theory (exclusive of individual reading). Of the 36 credits of coursework, 21 must be at the 600 level.

#### Required Courses for Both Options

3300:670	Modern Linguistics	3
3300:673	Theories of Composition	3

3300:674	Research Methodologies in Composition	3
3300:676	Theory and Teaching of Basic Composition	3

#### Other Available Courses for Both Options

##### Composition and Rhetoric:

3300:575	Theory of Rhetoric	2
3300:679	Scholarly Writing	3
3300:689	Seminar: Reading Theory	3

##### Linguistics:

3300:570	History of the English Language	3
3300:571	U.S. Dialects: Black and White	3
3300:589	Grammatical Structures of Modern English	3
3300:589	Sociolinguistics	3
3300:689	Contextual Linguistics	3

##### Literature and Literary Theory:

Any approved department offering at the 500 or 600 level.

#### Graduate Foreign Language Requirement for All Master's Degrees in English:

The language requirement for the M.A. in English and the M.A. in English: Alternate Track in Composition is as follows:

Demonstration of reading proficiency in a foreign language appropriate to English Studies. Completion of one junior- or senior-level course in a foreign language (with a grade of "B" or better) will exempt the student from examination provided the course was taken no more than five years before the student began his or her graduate work.

Note: 3300:600 Teaching College Composition Practicum is required for Teaching Assistants. This does not count toward the degree requirements.

†Unless the student has passed a comparable course at the undergraduate level with a grade of "B" or better.

## Geography and Planning

### Master of Arts in Geography

#### Nonthesis Option

- A minimum of 39 graduate credit hours, to include no more than 6 credits of 3350:698. At least 12 credit hours must be taken at the 600 level, excluding 3350:698 and 699.

- Core Requirements – 12 credit hours (4 courses)

3350:581	Research Methods in Geography and Planning
3350:583	Spatial Analysis
3350:596	Field Research Methods
3350:687	History of Geographic Thought

- Seminars: Completion of research papers in at least 2 courses from the following (6 hours):

3350:600	SEM: (tag)
3350:601	SEM: (tag)
3350:602	SEM: (tag)

- Electives – 21 credit hours

Any course taken outside the department must be approved in advance by the student's Graduate Adviser or the Department Chair.

#### Thesis Option

- A minimum of 36 graduate credit hours, to include no more than 6 credits of 3350:698. At least 12 credit hours must be taken at the 600 level, excluding 3350:698 and 699.

- Core Requirements (12 credit hours)

3350:581	Research Methods in Geography and Planning
3350:583	Spatial Analysis
3350:596	Field Research Methods
3350:687	History of Geographic Research

- Thesis – 9 credit hours

- Electives – 15 credit hours, at least 3 credits of which must be from the following:

3350:600	SEM: (tag)
3350:601	SEM: (tag)
3350:602	SEM: (tag)

Any course taken outside the Department must be approved in advance by the student's Graduate Adviser or the Department Chair.

## Master of Science in Geography

- Minimum of 39 graduate credit hours, to include no more than 6 credits of 3350:698. At least 12 credit hours must be taken at the 600 level, excluding 3350:698 and 699.

- Core Required Courses – 15 credit hours

3350:581	Research Methods in Geography and Planning
3350:583	Spatial Analysis
3350:596	Field Research Methods
3350:687	History of Geographic Thought
3350:680	Advanced Spatial Analysis

- Methods/Techniques Requirement

At least 4 courses (12 credit hours) from:

3350:503	Computer Applications in Geography and Planning
3350:505	Geographic Information Systems
3350:542	Thematic Cartography
3350:547	Introduction to Remote Sensing
3350:548	Advanced Cartography
3350:600	SEM: Spatial Analysis
3350:637	Methods of Planning Analysis I

- Electives – 12 credit hours

Any course taken outside the department must be approved in advance by the student's Graduate Advisor or the Department Chair.

## Master of Arts (Geography/Urban Planning)

- A total of 45 credits of coursework plus internship (3350:685) as follows:

- Core Requirements

3350:533	Introduction to Planning
3350:536	Urban Land Use Analysis
3350:581	Research Methods in Geography and Planning
3350:583	Spatial Analysis
3350:630	Planning Theory
3350:631	Facilities Planning
3350:632	Land Use Planning Law
3350:637	Methods of Planning Analysis I
3350:638	Methods of Planning Analysis II
3350:639	Development of American Planning

- Electives – 5 courses, with a concentration from one of the following groups.

### Land Use and Transportation (any three)

3350:522	Transportation Systems Planning
3350:528	Industrial and Commercial Site Location
3350:595	Soil and Water Field Studies
3350:680	Advanced Spatial Analysis

### Cartography/Remote Sensing (any three)

3350:542	Thematic Cartography
3350:544	Applications in Cartography and Geographic Information Systems
3350:547	Introduction to Remote Sensing
3350:548	Advanced Cartography
3350:549	Advanced Remote Sensing

### Comparative Planning (any three)

3350:538	World Metropolitan Areas
3350:550	Development Planning
3350:571	Medical Geography and Health Planning
3350:633	Comparative Planning
3350:680	Advanced Spatial Analysis

### G.I.S. (any three)

3350:505	Geographic Information Systems
3350:542	Thematic Cartography
3350:547	Introduction to Remote Sensing
3350:548	Advanced Cartography
3350:680	Advanced Spatial Analysis

## Geology

### Master of Science

- Complete a minimum of 30 credits of which at least 10 credits shall be at the 600 level and no more than two in research problems and six in thesis research.
- In all geology M.S. degree programs except Engineering Geology, at least 22 graduate credits shall be geology courses.
- Proficiency examination at the beginning of program to determine any weaknesses in undergraduate preparation. The student who demonstrates a lack of basic knowledge will be required to take appropriate undergraduate courses. The student may not begin formal thesis work until he/she has successfully passed the proficiency examination and has corrected deficiencies from same. (Formal thesis work includes thesis proposal and/or thesis research credits). Field camp can be taken for graduate credit; however, it will not count toward the 30 credits for the M.S. in the geology or geophysics options.

- Core Requirements:

3370:680	Seminar in Geology	2
3370:699	Master's Thesis	6

- Pass comprehensive examination after completion of 18 credits. Examination may be attempted twice.

- Oral presentation and defense of thesis.

## Degree Specialization

The program of each individual will be adapted to his/her career objectives.

### Geology

Equivalents of the current geology, cognate science and mathematics requirements for the University's B.S. in geology are required.

### Earth Science

Equivalents of the current geology courses for the University's B.A. in geology are required. Course program will be selected to provide the student with a well-rounded background in lithosphere, hydrosphere and atmosphere. Those who will be teachers must take 5300:780 Seminar in Secondary Education: Earth Science, or equivalent.

### Geophysics

Equivalents of the geology, cognate science and mathematics requirements for the University's B.S. in geophysics are required.

### Engineering Geology

This program is for the graduate engineer and geologist who wishes to broaden expertise in the other field. The entering student who has some deficiencies in either engineering or geology may have to satisfy one or more of the following requirements while proceeding with graduate studies. A committee of engineering geology faculty will determine appropriate coursework on an individual basis.

3370:101	Introductory Physical Geology	4
3370:210	Geomorphology	3
3370:350	Structural Geology	4
3450:221,2,3	Analytical Geometry Calculus I, II, III	12
4300:201	Statics	3
4300:202	Introduction to Mechanics of Solids	3
4300:313	Soil Mechanics	3
4300:314	Geotechnical Engineering	3

- Required courses:

Graduate Geology Courses	18
Graduate Engineering Courses	8

### Environmental Geology

Equivalents of the current science and mathematics requirements for the University B.S. in geology are required. As many as eight credits may be selected from engineering, biology and/or geography with the approval of a geology adviser.

## History

### Master of Arts

- Students applying for admission to the M.A. program must have a minimum undergraduate grade-point average of 3.0. The applicant's average in history courses should be substantially higher. Applicants must also have completed at least 24 semester or 36 quarter hours in history courses at the undergraduate level. An application to the M.A. program consists of the following:

- an application form;
- a letter of intent, stating the applicant's reasons for wishing to pursue graduate work and the fields of history which the applicant intends to study;
- scores on the Graduate Record Examination, General Aptitude Test;
- a writing sample, preferably a research paper from a history class;
- three letters of recommendation, preferably from faculty who know the applicant well.
- Applicants whose native language is not English must also score at least 580 on the Test of English as a Written Language (TOEFL), at least 240 on the Test of English as a Spoken Language (TSE), and take the Test of Written English (TWE).

- Degree requirements include:

- Satisfactory completion of a minimum of 30 credits of graduate study in history, of which only six may be in individual reading.
- Concentrated study of three fields, two of which must be chosen from the following:

Ancient	America to 1877
Medieval	United States Since 1877
Europe, Renaissance to 1750	Latin America
Europe, 1750 to the Present	East Asia
England and the Empire	History of Science

The third field must be chosen from the above history fields or from an approved cognate discipline.

- The student must pass written examinations in two of the three fields. The third field requirement will be met by at least seven credits of coursework at the graduate level, completed with a GPA of 3.0.
- 3400:689 Historiography
- Twenty-three hours of 600-level coursework, at least 16 credits of which must be in seminars. Seminars must be chosen to satisfy one of the following options.

**Option I**

Three reading seminars and one writing seminar, with the writing seminar paper read and approved by two faculty members.

**Option II**

Two reading and two writing seminar sequences under different professors with the writing seminar paper of the student's choice read and approved by two faculty members.

**Option III**

Two reading seminars, one writing seminar and a thesis read and approved by two faculty members.

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## Mathematical Sciences

### Master of Science – Mathematics

Completion of a placement process prior to the beginning of classes in the student's first semester in the program. This process will consist of a review by a graduate faculty subcommittee of the student's competency in Advanced Calculus I and II (3450:521,2) and Abstract Algebra I (3450:511). If the student fails any part of this review, then that course will be added to the required courses for the student and the total number of credits required for the degree will reflect this.

- Core:
 

Two of the following three courses:		
3450:510	Advanced Linear Algebra	3
3450:512	Abstract Algebra II	3
3450:611	Topics in Algebra	3
And all of the following courses:		
3450:621	Real Analysis	3
3450:622	Measure Theory	3
3450:625	Analytic Function Theory	3
3450:692	Seminar in Mathematics	1-3

**Thesis Option (30-39 credits)**

In addition to the placement review and core requirements, 9-11 credits of 500/600-level courses in mathematics (3450), statistics (3460), or approved computer science (3460), and 2-4 credits in 3450:699 *Master's Thesis* must be completed. Any graduate-level course may be substituted as an elective provided that this is approved beforehand by the student's advisory committee.

**Nonthesis Option (33-42 credits)**

In addition to the placement review and core requirements, 16 credits of 500/600-level courses in mathematics (3450), statistics (3460), or approved computer science (3460) must be completed. Any graduate-level course may be substituted as an elective provided that this is approved beforehand by the student's advisory committee.

Successful completion of the comprehensive examinations in the two courses selected from among 3450:510, 512 or 611 and in the courses 3450:621, 622 and 625.

### Master of Science – Statistics

- Entrance into the program will require the initial completion of the following prerequisites:
  - 3470:561 *Applied Statistics I*, four credits; or equivalent.
  - 3470:515 *Math Concept for Statistics*, four credits, or 3450:521/522 *Advanced Calculus I/II*, three credits each, or equivalent.
- Core curriculum:
 

3470:651	Probability and Statistics	4
3470:652	Advanced Mathematical Statistics	3
3470:655	Linear Models	3
3470:663	Experimental Design	3
3470:665	Regression	3
3470:692	Seminar in Statistics	1-3

**Thesis Option (30 credits of graduate work)**

In addition to the core curriculum, 8-10 credits in 500/600-level mathematical sciences courses and 2-4 credits in 3470:699 *Master's Thesis* must be completed.

**Nonthesis Option (33 credits of graduate work)**

In addition to the core requirements, 15 credits in 500/600-level mathematical sciences courses must be completed.

- A comprehensive examination, taking the form suggested by the department, must be completed in the thesis or nonthesis option.
- With the consent of the department, up to 6 credits of approved graduate-level electives outside the department may be substituted in the thesis or nonthesis option.

### Master of Science – Applied Mathematics

**Option I**

Completion of a placement process prior to the beginning of classes in the student's first semester in the program. This process will consist of a review by a graduate faculty subcommittee of the student's competency in Advanced Calculus I and II (3450:521,2) and of his or her background in at least one junior-level or higher course in engineering or physics. If the student fails any part of this review, then that course will be added to the required courses for the student and the total number of credits required for the degree will reflect this.

- Core:
 

3450:510	Advanced Linear Algebra	3
3450:621	Real Analysis	3
3450:625	Analytic Function Theory	3
3450:6278	Advanced Numerical Analysis I, II	6
3450:633,4	Methods of Applied Mathematics I, II	6
3450:692	Seminar in Mathematics	1-3

**Thesis Option (30-39 credits)**

In addition to the placement review and core requirements, 3-5 credits of approved 500/600 level courses in mathematics (3450), statistics (3460), or computer science (3460), and 2-4 credits in 3450:699 *Master's Thesis* must be completed. Any graduate-level course may be substituted as an elective provided that this is approved beforehand by the student's advisory committee.

**Nonthesis Option (33-42 credits)**

In addition to the placement review and core requirements, 10 credits of approved 500/600 level courses in mathematics (3450), statistics (3460), or computer science (3460), must be completed. Any graduate-level course may be substituted as an elective provided that this is approved beforehand by the student's advisory committee.

Successful completion of the Comprehensive Examination in the courses 3450:621, 625, 627, 633 and 634.

**Option II**

Completion of a placement process prior to the beginning of classes in the student's first semester in the program is required. This process will consist of a review by a Graduate Faculty subcommittee of the student's competency in Advanced Calculus I and II (3450:521-522) and Mathematical Models (3450:536). If the student fails any part of this review, then that course will be added to the required courses for the student and the total number of credits required for the degree will reflect this.

- Core:
 

3450:510	Advanced Linear Algebra	3
3450:621	Real Analysis	3
3450:627	Advanced Numerical Analysis I	3
3450:635	Optimization	3
3450:636	Advanced Combinatorics and Graph Theory	3
3470:650	Advanced Probability and Stochastic Process	3
3470:651	Probability and Statistics	4
3450:692	Seminar in Mathematics	1-3

**Thesis Option (30-39 credits)**

In addition to the placement review and core requirements, 2-4 credits of approved 500/600-level courses in mathematics (3450), statistics (3460) or computer science (3460), and 2-4 credits in 3450:699 *Master's Thesis* must be completed. Any graduate-level course may be substituted as an elective provided that this is approved beforehand by the student's advisory committee.

**Nonthesis Option (33-42 credits)**

In addition to the placement review and core requirements, 9 credits of approved 500/600-level courses in mathematics (3450), statistics (3460), or computer science (3460) must be completed. Any graduate-level course may be substituted as an elective provided that this is approved beforehand by the student's advisory committee.

Successful completion of the Comprehensive Examinations in the courses 3450:621, 627, 635, 636 and 3470:651 is required.

## Master of Science – Computer Science

### Admission Requirements

All applicants for admission to the graduate program in computer science must meet the university requirements for graduate admission as published in Section 3 of the *Graduate Bulletin*. In addition to these requirements, the applicant must also:

- submit 3 letters of recommendation from individuals capable of evaluating the applicant's potential for success in the program;
- have earned a baccalaureate degree in computer science or a related discipline from an accredited college or university with a GPA of 3.00 or higher in computer science and related courses;
- demonstrate proficiency in the areas of differential and integral calculus, probability and statistics, discrete mathematics, and knowledge of at least one high-level, general purpose programming language; and,
- demonstrate proficiency in the areas of data structures, assembly language, computer organization, operating systems, and the theory of programming languages. A student deficient in one or more of these areas may be granted conditional admission.

The Graduate Record Examination (Aptitude and Advanced Computer Science Tests) is recommended.

### Degree Requirements

The curriculum has been designed to follow the guidelines and recommendations of the Association for Computing Machinery for Master's Programs in Computer Science. Most full-time degree candidates admitted into the program will complete the degree requirements in two years. The thesis option requires 30 semester hours of graduate work while the nonthesis option requires 33.

- Core Courses (required of all students):

Seven courses must be chosen from the following categories: two from each of categories A and B, and one from each of categories C, D, and E.

- Programming Languages
  - Operating Systems and Computer Architecture
  - Theoretical Computer Science
  - Data and File Structures
  - Applications
- Complete at least one 2-course sequence from each of the following groups:  
Group 1: (526, 626), (540, 640), (565, 665)  
Group 2: (555, 655), (557, 657), (560, 660), (570, 670), (575, 675)
  - 3460:692 *Seminar in Computer Science*. This seminar is an introduction to research in computer science. For thesis option students, it is the beginning of the thesis research.
  - At least 20 credits must be taken at the 600 level.
  - With prior consent, up to 3 credits of approved graduate-level work outside the department may be substituted for elective courses in both the thesis and non-thesis options.
  - A written comprehensive examination, taking the form suggested by the department, must be completed in the thesis or non-thesis option. The examination will cover four areas of computer science chosen by the student and the student's advisor. Two of the areas will be based on the two-course sequences (listed in Option II) above.

### Thesis Option (30 credits of graduate work)

In addition to the core curriculum, 3-5 credits in approved 500/600-level departmental courses and 2-4 credits in 3460:699 *Master's Thesis* must be completed.

### Non-thesis Option (33 credits of graduate work)

In addition to the core curriculum, 9-10 credits in approved 500/600-level departmental courses must be completed.

## Coordinated Program

### Coordinated Engineering Applied Mathematics program for the Doctor of Philosophy in Engineering degree between the College of Engineering and the Department of Mathematical Sciences

The faculty in the College of Engineering and the Department of Mathematical Sciences have agreed to provide a coordinated program, subject to the following conditions, for those graduate students who elect the interdisciplinary field of Engineering Applied Mathematics.

### Admission Requirements

Applicants for the Engineering Applied Mathematics Program must have their graduate application and credentials evaluated by one of the departments in the College of Engineering and the Department of Mathematical Sciences. The Admission Requirements for the Doctor of Philosophy in Engineering, as given in the *Graduate Bulletin* (see page 36, College of Engineering), shall apply to all applicants for the Engineering Applied Mathematics Program.

## Physics

### Master of Science

- Complete a minimum of 30 graduate credits of approved courses in physics. Up to six credits of graduate-level electives outside the department may be included in the program. There is no foreign language requirement for this degree.
- A cumulative grade-point average of 3.00 or better for all graduate-level credits applicable toward the degree.
- Complete an approved program of courses which includes the following required courses:

3650:551,2	Advanced Laboratory I, II	4
3650:615	Electromagnetic Theory I	3
3650:625	Quantum Mechanics I	3
3650:641	Lagrangian Mechanics	3
3650:661	Statistical Mechanics	3

A student preparing for further graduate work in a physical science or for academic or industrial employment should include the following courses in the graduate program:

3650:581,2	Methods of Mathematical Physics I, II	6
3650:616	Electromagnetic Theory II	3
3650:626	Quantum Mechanics II	3

A student preparing for teaching secondary school science should include the following courses in the graduate program:

3650:500	History of Physics	3
3650:504	Energy and Environment	3
3650:568	Digital Data Acquisition	2
3650:590	Workshops (maximum credit)	6

A student must complete at least one of the following three options:

Option A: A written exam covering the field of physics at the advanced graduate level.

Option B: A formal report, based on an original research project, submitted in a form suitable for publication and approved by a physics faculty committee.

Option C: A master's thesis.

- Graduate research participation is strongly encouraged. Up to five credits may be earned in 3650:697 *Graduate Research*, upon the completion of a graduate research project. One additional credit may, upon approval by the department, be permitted in 3650:699 *Master's Thesis* for the completion of a master's thesis based on such research. A successful thesis may thus account for up to six of the total of 30 graduate credits required.

## Political Science

### Master of Arts

#### Admission

Admission is open to students who have completed a four-year undergraduate degree and who fulfill the admission requirements of the Graduate School. The Graduate Record Examination (GRE) is not required.

The Master of Arts in Political Science allows students to concentrate their study in one of four areas: American Politics, Comparative Politics, International Politics, or Political Theory.

Students may also work toward certificates in Applied Politics and Public Policy in conjunction with their graduate studies.

#### Degree Requirements

- Complete 30 credits of graduate work, including 18 credits at the 600 level.

Two required core courses:		
3700:600	Scope and Theory of Political Science	3
3700:601	Research Methods in Political Science	3

Three additional departmental seminars – 9 credits (Neither Independent Research, Thesis, nor Internship is considered a graduate seminar).

Three additional credits at the 600 level.

Twelve additional credits at the graduate level.

- Pass a comprehensive written examination covering one field (American Politics, Comparative Politics, International Politics, or Political Theory).
- Complete **either** of the following:

A master's **thesis**, including six hours of thesis credit (3700:699) in preparation. These credits may be presented as part of the overall 30-credit requirement. The thesis topic and completed thesis must be approved by the student's thesis committee and the student must complete a successful oral defense of the thesis.

A **nonthesis option**, which shall consist of two extended seminar papers approved by a department committee of three persons chosen by the student with the approval of the graduate adviser.

## Master of Applied Politics\*

The Master of Applied Politics, through the Ray C. Bliss Institute of Applied Politics, is one of the few programs in the United States focusing on practical politics. It is designed for students interested in efforts to influence political decisions. This includes activities to capture elective public office in partisan contests, influencing legislation, and political organization.

\* Program pending approval by Ohio Board of Regents.

### Admission

Admission is open to students who have completed a four-year undergraduate degree and who fulfill the admission requirements of the Graduate School. No specific field of undergraduate major is required for admission. The Graduate Record Examination (GRE) is not required. The program is designed to accommodate students taking course work on a part-time basis.

### Degree Requirements

- Complete 39 credits of graduate work, including the following:

- Core courses - 27 credits:

3700:570	Campaign Management I	3
3700:571	Campaign Management II	3
3700:572	Campaign Finance	3
3700:540	Survey Research Methods	3
3700:600	Scope and Theory of Political Science	3
3700:601	Research Methods in Political Science	3
3700:695	Internship in Government and Politics	*3
3700:672	Seminar: Political Influence and Organizations	3
7600:691	Advanced Communication Studies: Communication in Political Campaigns	3

\* Three credits required: additional credits will be counted toward elective credit.

- Elective courses - 12 credits (6 credits must be at the 600-level) selected from the following courses:

3700:502	Politics and the Media	3
3700:574	Political Behavior and Electoral Politics	3
3700:573	Voter Contact and Elections	3
3700:575	American Interest Groups	3
3700:576	American Political Parties	3
3700:620	Seminar in Comparative Politics	3
3700:630	Seminar in National Politics	3
3700:668	Seminar: Policy Agendas and Decisions	3
3700:690	Special Topics in Political Science (applied focus)	3
3700:697	Independent Research and Readings (applied focus)	3
7600:665	Theories of Argument and Persuasion	3

- Prepare an applied politics portfolio containing:

- At least two major papers prepared for required courses.
- An applied politics capstone project assigned by the student's advisor.

- Pass an oral defense of the applied politics portfolio.

## Psychology

### Master of Arts

- Fulfill admission requirements of the Graduate School and the following departmental requirements:

- equivalent of psychology undergraduate major including a general or introductory course, statistics course, and experimental psychology course;
- GPA of 3.00 in psychology courses;
- Graduate Record Examination, Aptitude and Advanced Psychology Test;
- three letters of recommendation.

- Course requirements:

- completion of a minimum of 30 credits of graduate psychology courses including the M.A. core courses or equivalents, specialty area required courses, and electives as specified in the department's graduate student manual;
- a student is required to maintain at least a 3.5 grade-point average in M.A. core courses as well as overall.

- Other requirements:

- refer to the Department of *Psychology Graduate Student Manual* for additional guidelines;
- complete and fulfill general master's degree requirements of the Graduate School.

### Thesis Option

Completion of a minimum of 39 credits of graduate work including thesis in industrial/organizational, counseling or applied cognitive aging psychology (although most programs require more credits).

### Nonthesis Option

Completion of a minimum of 37 credits of graduate work with no thesis required. Completion of coursework, practicum and examinations in either industrial/organizational, counseling or applied cognitive aging psychology (although most programs require more credits).

## Public Administration and Urban Studies

### Master of Arts in Urban Studies

#### Admission

Admission is open to students who have completed a four-year undergraduate degree, whose academic records meet the standards required for admission to the Graduate School. No specific field of undergraduate major is required for admission. The GRE score is not required for admission.

Courses may be taken outside the Department of Public Administration and Urban Studies for the purpose of fulfilling any of the requirements listed below but must be approved by the department prior to registration.

Each student will, upon entering the program in consultation with a faculty adviser, plan a complete course of study which includes 15-18 hours of core and 15-18 hours of approved electives.

- Core:

3980:600	Basic Quantitative Research	3
3980:601	Advanced Research and Statistical Methods	3
3980:602	History of Urban Development	3
3980:641	Urban Economic Growth and Development	3
3980:643	Introduction to Public Policy	3
3980:699	Master's Thesis (optional)	4

#### Basic Program

Complete 33 credits of coursework as follows:

- Core - 15-18 credits.
- Approved electives - 15-18 credits.
- 3 credits of approved electives may be substituted for thesis with approval of academic adviser.

### Master of Public Administration (MPA)

The Program in Public Administration is specifically designed to prepare the student for a public service career in public management and administration, as well as the management and administration of non-profit organizations. The program of study is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA).

#### Admission

Admission is open to students who have completed a four-year undergraduate degree, whose academic records meet the standards required for admission to the Graduate School. No specific field of undergraduate major is required for admission. The GRE score is not required for admission.

#### Degree Requirements

- The number of graduate credits required for the MPA will be as follows:

Master's Degree in Public Administration	45 credits
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- Core requirements (36-39 credits):

3980:600	Basic Quantitative Research	3
3980:601**	Advanced Research and Statistical Methods	3
3980:610	Legal Foundations of Public Administration	3
3980:611	Introduction to the Profession of Public Administration	3
3980:614	Ethics and Public Service	3
3980:615	Public Organization Theory	3
3980:616	Personnel Management in the Public Sector	3
3980:640*	Fiscal Analysis	3
3980:642*	Public Budgeting	3
3980:643	Introduction to Public Policy	3
3980:695***	Internship (may be repeated for a total of 6 credits)	3
3980:699	Master's Thesis (optional)	3

- and select 1 from the following 3 courses:

3980:602	History of Urban Development	3
3980:617	Leadership and Decision Making	3
3980:671	Program Evaluation	3

\*Students may take 3250:606 Economics of the Public Sector and 3250:506 State and Local Public Finance to fulfill the requirements of 3980:640 Fiscal Analysis and 3980:642 Public Budgeting. Students must, however, take both 3250:606 and 3250:506 or both 3980:640 and 3980:642.

\*\*Student may take either 3980:674 or 3980:673 in lieu of 3980:601. Students may also take either 3980:602, 3980:617 or 3350:630 in lieu of 3980:643.

\*\*\*Student working full-time may satisfy Internship without a field placement. See advisor for alternative requirement.

Any required course except 3980:699, *Master's Thesis*, may be waived on the basis of proficiency in the area covered by the course. The criteria for waiver considered by the department are:

- Completion of a comparable course in another department at the University.
  - Transfer of course credit in a comparable course from another university.
  - Proficiency in an area demonstrated by a group of courses or other work done in the area covered by the course.
  - Areas of Concentration:
    - Public and Non-Profit Management
    - Urban Theory and Administration
    - Public Sector Economics and Financial Management
    - Public Policy Analysis and Program Evaluation
- See advisor for suggested courses. Students are encouraged to construct a coherent set of courses that will contribute to more in-depth or multi-disciplinary knowledge of a given area of concentration.

• Advanced Elective Courses (6-9 credits):

3250:639	Public Employee Labor Markets	3
3250:666	Seminar in Regional Economic Analysis and Development	3
3700:630	Seminar in National Politics	3
3700:641	Seminar in Intergovernmental Relations	3
3700:670	Seminar in the Administrative Process	3
3980:590	Workshop	1-3
3980:612	National Urban Policy	3
3980:613	Intergovernmental Management	3
3980:618	Citizen Participation	3
3980:620	Social Services Planning	3
3980:621	Urban Society and Service Systems	3
3980:622	Urban Planning and Health Care	3
3980:623	Public Works Administration	3
3980:636	Parks and Recreation	3
3980:641	Urban Economic Growth and Development	3
3980:650	Comparative Urban Systems	3
3980:670	Research for Futures Planning	3
3980:671	Program Evaluation in Urban Studies	3
3980:672	Alternative Urban Futures	3
3980:673	Computer Applications in Public Organizations	3
3980:674	Analytical Techniques for Public Administration	3
3980:680	Selected Topics in Urban Studies	3
3980:681	Selected Topics in Urban Studies	3
3980:697	Individual Studies	1-3

## J.D./Master of Public Administration

The University offers a joint J.D. and Public Administration program. The title is J.D./M.P.A.

To be accepted into the program, a student must meet the admission requirement of the School of Law, the Graduate School, and the Department of Public Administration and Urban Studies.

### Degree Requirements

Seventy-six credits in law and 30 credits in public administration.

Under this program a student must take 43 credits of required law courses, 32 credits of law electives, and 30 credits of required public administration courses plus an internship of three credits. (Internship is required of any student without professional administrative experience.)

This program reduces the total existing credit hours of the School of Law and Public Administration by nine credit hours (from 85 to 76), while public administration requirements are reduced by 12 credit hours (from 42 to 30).

## Sociology

### Master of Arts

#### Thesis Option

Satisfactory completion of 32 semester credits of which at least 21 must be at the 600 level or higher in sociology or anthropology (excluding 3850:699; 3850:697 and 3850:698). In meeting these requirements the student must:

- Complete five required core courses with at least a 3.00 grade-point average:
 

3850:603	Sociological Research Methods	3
3850:604	Social Research Design	3
3850:617	Sociological Theory	3
3850:631	Social Psychology	3
	or	
3850:645	Social Organization	3
3850:706	Multivariate Techniques in Sociology	3
- Complete at least six hours of thesis work (3850:699). No more than six credits will count toward the degree.
- Completion of master's thesis and successful oral defense of thesis.

#### Nonthesis Option

This degree is intended for the student who wants intensive substantive training in a specialized area.

Completion of 32 credits of graduate work with no more than six credits taken at the 500 level. In meeting these requirements the student must:

- Complete four required core courses with at least a 3.00 grade-point average:
 

3850:603	Sociological Research Methods	3
3850:604	Social Research Design	3
3850:617	Sociological Theory	3
3850:631	Social Psychology	3
	or	
3850:645	Social Organization	3
- Completion of at least 15 credits in a contracted specialty area. This area must be defined in consultation with the student's adviser and approved by the Graduate Studies Committee. Courses from other departments may be taken to meet the specialty requirement.
- Pass an oral examination on the specialty area.

## Anthropology

There is no graduate degree in anthropology. However, there are many graduate courses available. A student interested in taking such courses for graduate credit must be admitted to the Graduate School through an existing graduate program, or may apply for non-degree status through the Department of Sociology. The student should enroll in graduate courses only for specific professional preparation or enhancement and with the permission of the instructor. Inquiries should be directed to the graduate director in the Department of Sociology.

## Spanish

### Master of Arts

- Thirty-two semester credits of graduate work which may include a thesis amounting to four credits.
- Requirement: proficiency level in listening comprehension, speaking, reading, and writing Spanish.
- Second language requirement: completion of 202 with a grade of at least "B" in another language; or a translation from another language. Choice of the second language will be left to the student in consultation with an adviser.
- Final comprehensive examinations: the candidate will be required to submit an essay, and pass an oral exam on the essay.

# College of Engineering

Irving F. Miller, Ph.D., *Dean*

Max S. Willis, Ph.D., *Associate Dean,  
Research and Graduate Studies*

Paul C. Lam, Ph.D., *Associate Dean,  
Undergraduate Studies and Minority Affairs*

Deanna Dunn, *Coordinator of Engineering Cooperative  
Education Program*

## DOCTOR OF PHILOSOPHY IN ENGINEERING DEGREE

The Doctor of Philosophy in Engineering is an interdisciplinary doctoral program offered on a collegiate basis.

### Admission Requirements

Applicants for the Doctor of Philosophy in Engineering must hold a bachelor's degree from a program that is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology at the time of graduation, or provide satisfactory evidence of an equivalent academic background to the Dean of the College of Engineering.

Applicants with a master of science degree must provide satisfactory evidence of an equivalent engineering baccalaureate background to the Dean of the College of Engineering.

Applicants must submit official undergraduate transcripts, undergraduate grade point average, at least two letters of recommendation, and official results of the verbal, quantitative, and analytical portions of the GRE. Personal statements or descriptions of post-baccalaureate experience that provide a rationale for the proposed graduate study may also be submitted.

Applicants with a bachelor's degree must have a cumulative grade-point average of at least 3.0/4.0.

Applicants with a master's degree must have a cumulative graduate grade point average of at least 3.5/4.0.

Applicants whose native language is not English must have a TOEFL score of at least 550, and also must submit their score on the Test of Written English.

Applicants not satisfying the requirements for Full Admission may be classified either as a Provisional Admission or as a Deferred Admission.

Applicants with a bachelor's degree or a master's degree in a discipline other than engineering shall have completed undergraduate coursework in calculus, differential equations, have one year of classical physics, and must select and complete at least 24 credits of undergraduate coursework of which 18 credits must be from one of the four undergraduate engineering disciplines listed below. The remaining 6 credits may be from among the four disciplines listed below. These undergraduate engineering courses may be taken prior to graduate admission, or concurrently if the student has Full Admission or Provisional Admission, and is enrolled for at least 9 graduate credits.

#### Chemical Engineering

4200:325	Equilibrium Thermodynamics	4
4200:321	Transport Phenomena I	3
4200:322	Transport Phenomena II	3
4200:330	Chemical Reaction Engineering	3
4200:351	Fluid and Thermal Operations	3
4200:353	Mass Transfer Operations	3
4200:435	Process Analysis and Control	3
4200:441	Process Economics and Design	4
	Total	26

#### Civil Engineering

4300:306	Theory of Structures	3
4300:313	Soil Mechanics	3
4600:310	Fluid Mechanics	3
4300:323	Water Supply and Wastewater Disposal	4
4300:341	Hydraulic Engineering	3
4300:361	Transportation Engineering	3
4300:401	Steel Design	3
4300:403	Reinforced Concrete Design	3
	Total	25

#### Electrical Engineering

4400:360	Physical Electronics	3
4400:361	Electronic Design	4
4400:363	Switching and Logic	4
4400:334	Energy Conversion I	3
4400:335	Energy Conversion Lab	2

4400:445	Analog Communications	3
4400:553	Antenna Theory	3
4400:572	Control Systems II	4
	Total	26

#### Mechanical Engineering

4600:300	Thermodynamics I	4
4600:301	Thermodynamics II	3
4600:310	Fluid Mechanics	3
4600:315	Heat Transfer	3
4600:336	Analysis of Mechanical Components	3
4600:340	Systems Dynamics and Response	3
4600:330	Mechanical Metallurgy	2
4600:531	Fundamentals of Mechanical Vibrations	3
4600:541	Control System Design	3
	Total	27

### Degree Requirements

The University's Academic Requirements (See **Academic Requirements** in this *Graduate Bulletin*) for the Doctoral Degree and the following College of Engineering's academic requirements for the Doctoral Degree must be satisfied.

- Pass a departmental Qualifying Examination. The purpose of the qualifying examination is to determine admissibility to the doctoral program and any technical weakness.
- Identify an interdisciplinary field of study, a dissertation director, and an Interdisciplinary Doctoral Committee before completion of 18 credits of coursework.
- Complete a formal Plan of Study that is acceptable to the Interdisciplinary Doctoral Committee. The plan of study must have at least 48 credits of coursework, of which 42 credits must be at the 600 and 700 level and of which 6 credits may be special topics or 400/500 level courses. At least 24 of these course credits must be completed at The University of Akron. The minimum total credit hours for the doctoral program is 96 credit hours.
- Satisfy the language requirement specified by the Interdisciplinary Doctoral Committee.
- Pass a Candidacy Examination. The purpose of the candidacy examination is to test the student's ability to conduct independent research.
- Present an acceptable Dissertation Proposal that describes the proposed research to the Interdisciplinary Doctoral Committee.
- Present and successfully (no "fail" votes) defend the dissertation to the Interdisciplinary Doctoral Committee.

A copy of the Ph.D. in Engineering Program Procedures may be obtained from the office of the Dean of the College of Engineering.

### Interdisciplinary Fields of Study

The proposal to establish a doctoral program in the College of Engineering, which was approved by the Board of Trustees of The University of Akron and the Ohio Board of Regents in 1967-68, defines the four undergraduate departments, Chemical, Civil, Electrical, and Mechanical, as the basic disciplines for the interdisciplinary programs in Environmental Engineering, Materials Science, Mechanics, Systems Engineering, and Transport Processes. The objectives of the proposal were to 1) allow doctoral students access to the infrastructure resources of the entire college, 2) reduce administrative costs, and 3) permit the interdisciplinary programs to adapt to the changing research and funding environment. Since the approval of the proposal, the interdisciplinary areas have expanded from the original five programs to ten interdisciplinary programs. These interdisciplinary programs are broadly defined as follows.

*Environmental Engineering* includes the study of water and air pollution, environmental health, chemical disposal, waste management, noise control, resource engineering, and appropriate fields of urban planning.

*Mechanics* includes the theoretical and experimental study of the stresses, strains, and endurance of structures, machines and various materials, mechanics of solids, fluids, solid, and composite materials.

*Systems Engineering* include the scientific prediction, control, and evaluation of the performance of integrated operational systems, and interaction effects among the components of engineering systems. It includes system analysis and design, operations research, linear and dynamic programming.

*Materials Science* studies the materials from the physical, chemical, and engineering standpoints. Its purpose is to develop a better understanding of the composition, properties, and performance of various materials, and to develop new materials, manufacturing methods, and applications.

*Transport Processes* include the theoretical and experimental study of the transfer of mass, energy, and power, as related to engineering systems and processes.

*Biomedical Engineering* studies the theoretical and experimental application of engineering principles to biomedical problems. Some typical areas of interest are signal and image processing, biomechanics, and biomaterials.

*Polymer Engineering* combines fundamental engineering principles with the structure and rheological properties of polymers to design and analyze polymer processes and equipment.

*Engineering Applied Mathematics* applies advanced mathematics to technologically significant engineering problems.

*Chemical Reactions and Process Engineering* studies chemical reactions, homogeneous chemical reactions, heterogeneous chemical reactions, and catalysis as applied to process engineering.

*Microscale Physicochemical Engineering* studies small particles, surface science, agglomeration, and separation as applied to process engineering.

The interdisciplinary doctoral program has succeeded in providing doctoral students access to the resources of the entire college while providing an economically sound administration for a program that deals with a doctoral population that is much smaller than those for undergraduate or master's degrees.

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## COORDINATED AND JOINT PROGRAMS

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### Coordinated Engineering Applied Mathematics program for the Doctor of Philosophy in Engineering degree between the College of Engineering and the Department of Mathematical Sciences

The faculty in the College of Engineering and the Department of Mathematical Sciences have agreed to provide a coordinated program, subject to the following conditions, for those graduate students who elect the interdisciplinary field of Engineering Applied Mathematics.

#### Admission Requirements

Applicants for the Engineering Applied Mathematics Program must have their graduate application and credentials evaluated by one of the departments in the College of Engineering and the Department of Mathematical Sciences. The Admission Requirements for the Doctor of Philosophy in Engineering, as given in the *Graduate Bulletin*, shall apply to all applicants for the Engineering Applied Mathematics Program.

#### Degree Requirements

The applicable Degree Requirements for the Engineering Applied Mathematics Program are those given in the *Graduate Bulletin* under the section Doctor of Philosophy in Engineering. These degree requirements include passing a Qualifying Examination, identifying a Dissertation Director, establishing an Interdisciplinary Doctoral Committee, completing a formal Plan of Study, satisfying the University's language and residency requirement, passing a Candidacy Examination, presenting an acceptable Dissertation Proposal, writing a dissertation, and publicly and successfully (no "fail" votes) defending the dissertation before the Interdisciplinary Doctoral Committee.

Students in the Engineering Applied Mathematics Program must pass a departmental Qualifying Examination composed and administered by the participating faculty from the Department of Mathematical Sciences and the participating faculty from one of the four departments in the College of Engineering.

The Interdisciplinary Doctoral Committee shall consist of at least six members. It shall have an equal number of faculty with primary appointments in the College of Engineering and participating program faculty from the Department of Mathematical Sciences. The participating faculty from the Department of Mathematical Sciences must hold joint appointments in the College of Engineering.

Students lacking a bachelor's degree or master of science degree in engineering shall take a minimum of 24 credits of bridging courses of which 6 credits may be at the 500 level. (For a list of these bridging courses, see the Admission Requirements for the Doctor of Philosophy in Engineering degree.) Students with a bachelor's degree in engineering shall take:

3450.312	Linear Algebra	3
3450.427	Introduction to Numerical Analysis	3
3450.438	Advanced Engineering Mathematics I	3
3450.439	Advanced Engineering Mathematics II	3
3450.421	Advanced Calculus I	3
3450.422	Advanced Calculus II	3
	Total	18

The student may substitute 3450.601, *Introduction to Analysis*, for Advanced Calculus I and Advanced Calculus II. These bridging courses may be taken concurrently with graduate courses in the Engineering Applied Mathematics Program and they must be completed in the first two academic years of study.

Graduate students who elect the Engineering Applied Mathematics Program may proceed directly from their baccalaureate degree to the doctoral degree.

Students participating in the Engineering Applied Mathematics Program must have 42 credit hours of 600/700 level courses, of which none are special topics courses, and 6 credits of special topics or 400/500 level courses. At least 24 credit hours of coursework must be from the College of Engineering and at least 24 credits of coursework must be from the Department of Mathematical Sciences.

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### Coordinated program for the Doctor of Philosophy in Engineering degree between The University of Akron and Youngstown State University.

The University of Akron and Youngstown State University are engaged in a coordinated program with the objective of facilitating graduate study by engineering students residing in proximity to Youngstown State University. This provides the opportunity and convenience of completing some of the requirements for the Doctor of Philosophy in Engineering at The University of Akron through joint counseling and enrollment at Youngstown State University.

#### Admission Requirements

When an engineering graduate student at Youngstown State University declares an interest in the joint doctoral program, the student shall prepare a letter of intent, with academic credentials, to the dean of engineering at Youngstown State University. The dean of engineering at Youngstown State University shall forward the letter of intent and academic credentials, together with a recommendation, to the dean of engineering at The University of Akron. The dean of engineering at The University of Akron shall have the graduate faculty in the applicant's discipline evaluate the academic credentials and make a recommendation on the academic acceptability of the applicant. If the recommendation is favorable, the student shall be advised to apply to the Graduate School at The University of Akron for formal admission to the Doctoral Program in the College of Engineering at The University of Akron. The dean of Graduate Studies and Research at Youngstown State University shall be kept informed of the progress of the admission procedure. The applicant from Youngstown State University must satisfy the Admission Requirements for the Doctor of Philosophy in Engineering at The University of Akron.

#### Degree Requirements

The engineering student from Youngstown State University must satisfy the Degree Requirements for the Doctor of Philosophy in Engineering at The University of Akron subject to the following modifications.

One of the members of the interdisciplinary Doctoral Committee for the joint doctoral program candidate shall be an engineering faculty member from Youngstown State University and normally would be the student's dissertation director, although this is not necessary. The faculty member from Youngstown State University shall have adjunct status at The University of Akron and qualify for Category II graduate faculty membership.

One-half (24 credits) of the coursework and one-half (24 credits) of the research credits may be taken at Youngstown State University. The parity of courses is decided by the faculty on the interdisciplinary Doctoral Committee when the student submits a proposed Plan of Study. At the Advancement to Candidacy, the Committee recommends official transfer of credits from Youngstown State University to The University of Akron.

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### Joint program for the M.D. and Doctor of Philosophy in Engineering degree between the College of Engineering at The University of Akron and the Northeastern Ohio Universities College of Medicine.

The College of Engineering and NEOUCOM provide a coordinated program for those desiring both the M.D. and Doctor of Philosophy in Engineering degrees. This program integrates the knowledge and skills acquired by the student in each of the programs. Each individual coordinated degree program will be tailored to suit the background and research interests of the student. Additional information may be obtained from the Department of Biomedical Engineering at The University of Akron or NEOUCOM.

#### Admission Requirements

Applicants with a bachelor's or master's degree in a discipline other than engineering or in engineering will be required to meet the Admission Requirements for the Doctor of Philosophy Degree in Engineering. Applicants will be required to have completed the following courses and to have taken the MCAT prior to admission into the coordinated M.D. and Doctor of Philosophy in Engineering program:

M.D.	Principles of Chemistry I and II
M.D.	Organic Chemistry I and II
M.D.	Principles of Biology I and II

M.D., Ph.D.	Classical Physics I and II
Ph.D.	Statics
Ph.D.	Dynamics
Ph.D.	Strength of Materials (or Material Science)
Ph.D.	Basic Electrical Engineering (or Circuits I & II)
Ph.D.	Calculus I, II, III, and Differential Equations

4600:380	Mechanical Metallurgy	2
4600:444	Fundamentals of Mechanical Vibrations	3
4600:441	Control System Design	3
	Total	27

### Degree Requirements

To obtain an M.D. degree from NEOUCOM and a Doctor of Philosophy Degree in Engineering, the student must satisfy NEOUCOM's degree requirements and the College of Engineering's Doctor of Philosophy in Engineering Degree Requirements. This coordinated program does not change the degree requirements for either program.

## MASTER OF SCIENCE DEGREES

The degrees of Master of Science in Chemical Engineering, Master of Science in Civil Engineering, Master of Science in Electrical Engineering, Master of Science in Mechanical Engineering, and Master of Science in Engineering are offered.

### Admission Requirements

Applicants for any of these master of science programs must hold a bachelor's degree from a program that is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology at the time of graduation, or provide evidence of an equivalent academic background to the Dean of the College of Engineering and the appropriate department head.

Applicants must submit an official undergraduate transcript, undergraduate grade point average, at least two letters of recommendation, and official results of the verbal, quantitative, and analytical portions of the GRE.

Applicants with a bachelor's degree must have an overall grade-point average of 2.75 or better or 3.00 for the last two years (64 semester credits or equivalent).

Applicants whose native language is not English must have a TOEFL score of at least 550, and also must submit their score on the Test of Written English (TWE).

Applicants who do not satisfy the requirements for Full Admission may be granted Provisional Admission or Deferred Admission.

Applicants with a bachelor's degree in a discipline other than engineering shall have completed coursework in calculus, differential equations, have one year of classical physics, and must select and complete at least 24 credits of undergraduate coursework of which 18 credits must be from one of the four undergraduate disciplines listed below. These undergraduate engineering courses may be taken prior to graduate admission, or concurrently if the student has Full Admission or Provisional Admission, and is enrolled for at least 9 graduate credits.

#### Chemical Engineering

4200:325	Equilibrium Thermodynamics	4
4200:321	Transport Phenomena I	3
4200:322	Transport Phenomena II	3
4200:330	Chemical Reaction Engineering	3
4200:351	Fluid and Thermal Operations	3
4200:353	Mass Transfer Operations	3
4200:435	Process Analysis and Control	3
4200:441	Process Economics and Design	4
	Total	26

#### Civil Engineering

4300:306	Theory of Structures	3
4300:313	Soil Mechanics	3
4600:310	Fluid Mechanics	3
4300:323	Water Supply and Wastewater Disposal	4
4300:341	Hydraulics	3
4300:361	Transportation Engineering	3
4300:401	Steel Design	3
4300:403	Reinforced Concrete Design	3
	Total	25

#### Electrical Engineering

4400:360	Physical Electronics	3
4400:361	Electronic Design	4
4400:363	Switching and Logic	4
4400:384	Energy Conversion I	3
4400:385	Energy Conversion Lab	2
4400:445	Analog Communications	3
4400:453	Antenna Theory	3
4400:472	Control Systems II	4
	Total	26

#### Mechanical Engineering

4600:300	Thermodynamics I	4
4600:301	Thermodynamics II	3
4600:310	Fluid Mechanics	3
4600:315	Heat Transfer	3
4600:336	Analysis of Mechanical Components	3
4600:340	Systems Dynamics and Response	3

### Degree Requirements

The University's Academic Requirements (See **Academic Requirements** in this *Graduate Bulletin*), the following College of Engineering requirements and the department's academic requirements must all be satisfied for the master of science degrees in the College of Engineering.

- Identify a three-member Advisory Committee including a major adviser before completion of 9 credit hours of coursework.
- Complete a formal Plan of Study that is acceptable to the Advisory Committee with a minimum of 24 credit hours of coursework of which no more than 6 credits are special topics courses. The formal Plan of Study may be revised upon approval of the Advisory Committee.
- Successfully (no "fail" votes) defend the thesis before the Advisory Committee, or have the Engineering Report approved by the Advisory Committee, or successfully complete the appropriate department's nonthesis option requirements.

### Master of Science in Chemical Engineering

#### Thesis Option

4200:600	Transport Phenomena	3
4200:605	Chemical Reaction Engineering	3
4200:610	Classical Thermodynamics	3
	Chemical Engineering Electives*	6
	Approved Electives	6
	Approved Mathematics	3
	Master's Thesis	6
	Total	30

#### Nonthesis Option

4200:600	Transport Phenomena	3
4200:605	Chemical Reaction Engineering	3
4200:610	Classical Thermodynamics	3
	Chemical Engineering Electives*	6
	Approved Electives	18
	Approved Mathematics	3
	Total	36

Chemical engineering students in both degree options are expected to attend and to participate in the department's seminars.

### Master of Science in Civil Engineering

Areas of study in the department include structural mechanics, geotechnical, hydraulic, and environmental engineering.

#### Thesis Option

	Civil Engineering Courses	15
	Approved Mathematics or Science	3
	Approved Electives	6
	Master's Thesis	6
	Total	30

#### Nonthesis Option

	Civil Engineering Courses	15
	Approved Mathematics or Sciences	3
	Approved Electives	12
	Engineering Report	2
	Total	32

### Master of Science in Electrical Engineering

Areas of study in the department include computer engineering, control system engineering, power system engineering, electromagnetics, and related areas.

#### Thesis Option

	Electrical Engineering Courses**	15
	Approved Mathematics	6
	Approved Electives	3
	Master's Thesis	6
	Total	30

#### Nonthesis Option

	Electrical Engineering Courses**	18
	Approved Mathematics	6
	Approved Electives	9
	Total	33

\*The elective chemical engineering courses may not include more than three credits of 500 level courses.

\*\*The required electrical engineering coursework of 18 credits may not include more than six credits of 500-level courses.

Electrical engineering students pursuing the nonthesis option must pass a graduate level oral comprehensive examination which may be taken after 24 credits have been completed.

### Master of Science in Mechanical Engineering

Main areas of graduate study in mechanical engineering include systems and controls, engineering mechanics, and thermal-fluid sciences. Students in the department are encouraged to take at least one mechanical engineering course outside the main area of interest to develop some breadth in their graduate education.

#### Thesis Option

Mechanical Engineering Courses*	15
Approved Mathematics	3
Approved Electives	6
Master's Thesis	6
Total	30

#### Nonthesis Option

Mechanical Engineering Courses*	15
Approved Mathematics	3
Approved Electives	12
Engineering Report	2
Total	32

### Master of Science in Engineering

This program is intended for the student whose educational objectives cannot be met by the four departmental master of science programs or those who wish to specialize in biomedical engineering, polymer engineering, or engineering management. Except for students in biomedical engineering and polymer engineering, students should declare in writing to the Dean of Engineering of their intention to study toward the Master of Science in Engineering degree. Upon admission, the dean will appoint an advisory committee consisting of three faculty members who are selected from at least two different departments. The thesis must be successfully (no "fail" votes) defended before the Advisory Committee, or the engineering report must receive the approval of the Advisory Committee.

#### Thesis Option

Engineering Courses	12
Approved Mathematics or Science	3
Approved Electives	9
Master's Thesis	6
Total	30

#### Nonthesis Option

Engineering Courses	18
Approved Mathematics or Science	3
Approved Electives	9
Engineering Report	2
Total	32

### Biomedical Engineering Specialization

4800:601	Biomedical Instrumentation	4
4800:611	Biometry	3
3100:695	Physiology for Engineers and Lab	5
	Approved Electives	15
	Master's Thesis	6
	Total	33

### Polymer Engineering Specialization\*\*

Polymer Engineering Core	12
Polymer Engineering Electives	11
Approved Engineering and Science Elective	3
Thesis	6
Total	32

\*The program is limited to not more than three 500-level courses in engineering. Not more than two of the 500-level courses can be applied to the 15 credits of mechanical engineering coursework.

\*\*The specific courses for the Polymer Engineering Core Courses, Polymer Engineering electives, and Approved Engineering and Science Courses are listed under the College of Polymer Science and Polymer Engineering.

### Engineering Management Specialization

This is an evening program which is intended primarily for practicing engineers who are working full-time and wish to upgrade their engineering and management skills. The Engineering Management Report must be approved by the Advisory Committee, of which one member shall be from the College of Business Administration.

Engineering Courses	21
Management Courses	15
Engineering Management Report	2
Total	38

#### Required Courses

6200:601	Financial Accounting*
6400:602	Managerial Finance**
6500:600	Management and Organizational Behavior*
6600:600	Marketing Concepts*

#### Elective

Choose three credits of 600 level College Administration courses.

\*More advanced graduate business courses shall be required of students who have completed similar undergraduate courses. This determination shall be made by the Assistant Dean and Director of Graduate Business Programs, College of Business Administration.

\*\*6200:601 is a prerequisite for 6400:602.

# College of Education

Rita S. Saslaw, Ph.D., *Interim Dean*

Robert K. Eley, Ed.D., *Assistant Dean for Initial Programs*

Larry G. Bradley, Ph.D., *Director of Educational Outreach*

## Mission Statement

The University of Akron College of Education offers a comprehensive slate of programs for school and community professionals, with teacher education programs entitled "Educator as Decision Maker" as the cornerstone. Our faculty is a community of learners with wide-ranging specialties and strengths but firmly committed to a common goal: to prepare and support educators at all levels and across a range of school, community and agency settings for the challenges of the 21st century. The College holds primary responsibility within The University of Akron for producing educational personnel for Ohio schools and colleges, contributing to the positive reform of education, and strengthening the research and knowledge base of the discipline.

The College provides initial and advanced preparation and continuing professional development and support of educators from early childhood through adult. Educators include classroom teachers, teacher educators, and other personnel such as administrators, counselors, and school nurses. The College meets this comprehensive charge through teacher education programs as well as programs in counseling, technical education, athletic training for sports medicine, and a few teacher education program that are housed outside the College of Education.

## DOCTOR OF PHILOSOPHY DEGREE

Programs leading to the Doctor of Philosophy degree in elementary education, secondary education, counseling psychology, and guidance and counseling are offered through the College of Education. The degree will be awarded to the student who, in addition to filling the general requirements of the Graduate School, has met the following specific requirements:

- Completion of the Miller Analogies Test and/or the Graduate Record Examination. (Check departments for minimum score requirements.)
- A minimum of 90 or 120 graduate credits (including a 30-credit master's program where applicable; Counseling Psychology and Counseling require a minimum of 120 credit hours), including the doctoral dissertation. A student considered deficient in any area may be required to take additional courses.
- Completion of a foundation studies program designed to prepare the student before specialization.
- Successful completion of a test in a language judged not to be the student's native tongue:
  - a student in the Department of Counseling and Special Education may elect to develop appropriate research skills prescribed by the adviser in lieu of the foreign language requirements;
  - a student in the Department of Elementary Education may elect to develop appropriate alternative research skills prescribed by the adviser, subject to review by the department head, depending upon the career goal of the student and upon the academic and/or scientific requirement of the dissertation in lieu of the foreign language requirement;
  - a student in the Department of Secondary Education may elect to develop appropriate research skills prescribed by the adviser, subject to review by the department head, in lieu of the foreign language requirement.
- Completion of a least eight credits in cognate area.
- Completion of final written and oral examinations in the student's major field of concentration.
- Completion of a dissertation comprising not more than 20 credits. The oral examining committee must be constituted of at least five full-time faculty members, one of whom must be from outside the department.
- Pass the general requirements for the Doctor Philosophy degree.

## DOCTORAL PROGRAMS IN COUNSELING

### Collaborative Ph.D. Program in Counseling Psychology

The Collaborative Program in Counseling Psychology allows the students a choice of entry options: one through the College of Education for students with a master's degree and one through the College of Arts and Sciences for students with a baccalaureate degree. Students in both tracks are expected to attain a level of broad scientific competence in the core areas of psychology: the biological, social, cognitive-affective, and individual bases of human behavior. Counseling psychology coursework covers the special areas of theories of counseling and psychotherapy, supervision, vocational psychology, ethics, assessment, and research design. Practica and internship experiences are required of students in both tracks and range from skill building in basic psychological assessment and counseling, to actual work with clients, to a year-long, full-time internship in an applied service setting. Students receive exposure to both colleges through shared coursework and faculty involvement with dissertations but must formally enter through one or the other of the colleges.

The American Psychological Association (APA) has conferred accreditation on the Ph.D. Program in Counseling Psychology.

Admission to the Collaborative Program in Counseling Psychology will be handled through the department associated with the student's chosen emphasis.

Departures from the program may be made only with the approval of the counseling psychology program faculty. Students may be considered for admission to counseling psychology if they have a master's degree in counseling, guidance and counseling, psychology, school psychology, or a related field.

- Psychology Core (3750:610, 620, 630, 640) is required of all students.
- Students register for dual listed courses (3750/5600) under their home department code.
- The comprehensive written examination is prepared, administered, and graded by a Comprehensive Examination Committee composed of four faculty members, two from each track. At least one faculty member from each track participates in the oral portion of the Comprehensive Examination.
- Dissertation – at least one faculty member from each track is required on the student's dissertation committee.
- Internship – 2,000 hours post-master's with 1,700 hours over no more than two years. The internship site must be listed in the Association of Psychology Postdoctoral and Internship Centers (APPIC) Directory.
- Language and residency requirements are to be completed in accordance with the guidelines from the Graduate School and student's home department.
- Counseling and Special Education Track requirements:

Students may be considered for admission to the Counseling Psychology program through the Department of Counseling and Special Education if they have a master's degree in counseling, guidance and counseling, psychology, school psychology, or a related field.

#### Course Requirements

5100:640	Techniques of Research	3
5600:643	Counseling: Theory and Philosophy	3
5600:645	Tests and Appraisal in Counseling	4
5600:647	Career Development and Counseling Across the Lifespan	3
5600:651	Techniques of Counseling	3
3750:610	Psychology Core I	4
3750:620	Psychology Core II	4
3750:630	Psychology Core III	4
3750:640	Psychology Core IV	4
5600:702	Advanced Counseling Practicum (2 semesters; may be repeated for a total of 12 credits)	8
3750/5600:707	Supervision in Counseling Psychology I	3
5600:708	Supervision in Counseling Psychology II	3
3750/5600:710	Theories of Counseling and Psychotherapy	4
3750/5600:711	Vocational Behavior	4
3750/5600:712	Principles and Practice of Intelligence Testing	4
3750/5600:713	Professional, Ethical and Legal Issues in Counseling Psychology	4
3750/5600:714	Objective Personality Evaluation	4
3750/5600:715	Research Design in Counseling I	3
5600:716	Research Design in Counseling II	3
3750/5600:717	Issues of Diversity in Counseling Psychology	4
3750/5600:718	History and Systems in Psychology	2
3750/5600:796	Counseling Psychology Practicum	8
5100:741	Statistics in Education	3
5100:743	Advanced Educational Statistics	3
5100:---	College of Education Foundations	6
3750/5600:---	Electives	8
5600:899	Doctoral Dissertation (minimum)	15
	Internship	NC
	Minimum Total Credit Hours Required	120

## Ph.D. in Guidance and Counseling

The doctoral program in Guidance and Counseling is designed for students who hold a master's degree in counseling or a related field. The program allows the student a choice of three specialty areas: (a) Counselor Education; (b) Clinical Mental Health Counseling; and (c) Marriage and Family Therapy. Students in each specialty are expected to attain an advanced level of competence in the core areas of counseling, research, and their specialty. Practica and internship experiences are required in each specialty. In addition, the cognate and elective options allow students flexibility in designing a program that is consistent with their career goals. With the proper selection of courses, graduates of the program can meet the academic requirements for a Licensed Professional Clinical Counselor in Ohio. Graduates with a specialty in Marriage and Family Therapy with the proper selection of courses can meet the academic requirements for membership in the American Association for Marriage and Family Therapy.

The Graduate Record Examination (General Test) will be used as the qualifying examination.

The Ph.D. Program in Guidance and Counseling is accredited by the Council for Accreditation of Counseling and Related Education Programs (CACREP), a specialized accrediting body recognized by the Council on Postsecondary Education (COPA).

### Ph.D. in Guidance and Counseling Requirements:

<b>Master's Degree<sup>1</sup></b>	31-34
<b>Foundations of Education</b>	9
<b>Research and Statistics</b>	12
5100:741 Statistics in Education	3
5100:743 Advanced Educational Statistics	3
5600:715 Research Design in Counseling I	3
5600:716 Research Design in Counseling II	3
<b>Major: Guidance and Counseling</b>	29-32
(Must be taken after admission to the doctoral program)	
Required:	
5600:702 Advanced Counseling Practicum	12
5600:685 Internship in Counseling <sup>2</sup>	3-6
5600:707 Supervision in Counseling Psychology I	3
5600:708 Supervision in Counseling Psychology II	3
5600: Major Electives <sup>3</sup>	8
<b>Cognate</b>	
Cognate coursework must be taken outside the College of Education and approved by the major adviser.	
	10
<b>Electives</b>	
Electives to be selected with the approval of the student's major advisor.	
	10
<b>Dissertation</b>	15
Minimum Total Semester Credits	120

Normally a minimum of 60 semester hours must be taken after the student is admitted into the doctoral program in guidance and counseling.

<sup>1</sup>In order to be admitted into the doctoral program, a student must have completed a master's degree in Guidance and Counseling or a master's degree in a related field. Students must have completed graduate coursework in each of the following areas prior to enrolling in courses in their Ph.D. major of Guidance and Counseling: (1) an introductory course in school counseling, student personnel services, community counseling, or marriage and family therapy; (2) group testing; (3) career or vocational counseling; (4) counseling theory; (5) individual counseling; (6) group counseling; (7) practicum in counseling; (8) research techniques.

<sup>2</sup>A minimum of one academic year of full-time internship is required. An internship taken as part of a master's degree program may account for up to 50% of this requirement. If this is the case, the student is required to complete only three semester hours of 5600:685 after admission to the doctoral program.

<sup>3</sup>Selected with the approval of the student's major and relate to the student's specialty area of: (1) Counselor Education, (2) Clinical Mental Health Counseling, or (3) Marriage and Family Counseling/Therapy.

For further program details and specific admission requirements, contact the Department of Counseling and Special Education.

## DOCTOR OF PHILOSOPHY IN ELEMENTARY EDUCATION

The program leading to a Doctor of Philosophy Degree in Elementary Education is designed to enhance the professional growth of the practicing teacher academically and professionally. The program is predicated on the belief that an effective educator benefits from a well-planned program containing depth of study in three basic areas:

- A specific teaching area/subject discipline.
- Professional education.
- Other contributing disciplines.

With this philosophy in mind, the program provides study in a selected discipline, professional education, and cognate fields.

Course offerings are designed to present the required courses as well as those areas that will be explored in overcoming individual deficiencies and expanding the students' academic background. Basic minimum course requirements are in the following areas: (1) core, (2) teaching field, (3) professional education, and (4) cognate area. Three guidelines concerning these steps toward the degree are of particular significance.

- Written comprehensive should be taken after the completion of 60 hours of coursework and prior to the completion of 75 hours.
- Dissertation must be approved by the student's committee and reviewed by the dean of the College of Education.

The complete program description may be obtained from the department head of elementary education.

## DOCTOR OF PHILOSOPHY IN SECONDARY EDUCATION

The Department of Secondary Education offers a program leading to the Ph.D. This program is designed to meet the needs and interests of persons in public, postsecondary, higher education, and other institutions or agencies that might have educational programs.

A qualified student can, with consultation of an adviser, design a "field of study" to meet his/her career objectives within the expertise and resources of the department.

For further details contact the Department of Secondary Education on program options and specific admission requirements.

## DOCTOR OF EDUCATION DEGREE

The Department of Educational Administration offers a program leading to the Doctor of Education degree. One option is designed for persons in public or private K-12 educational organizations.

An option in Higher Education Administration is also offered by the department. This is designed for persons who wish to pursue a career in college, university or other post-secondary administrative positions. The program addresses such major institutional functions as academic administration, student services, finance, planning, development, and public relations. A student will have the opportunity to direct studies toward a particular career goal. A student may be admitted after either the bachelor's or the master's degree.

**Note:** Applications for admission to the Higher Education Administration option of the Doctor of Education degree are not being accepted at this time.

• Minimum Requirements of the K-12 Program	
Foundations (including dissertation)	31
School Administration (including doctoral residency seminar)	26
Curriculum and Supervision	12
Cognate	12
General Electives	9
• Minimum Requirements of the Higher Education Administration Program	
Foundations (including dissertation)	31
Educational Administration	16
Curriculum, Instruction and Student Services	6
Doctoral Residency Seminar	3
Cognate	12
General Electives	22

## Foundation Studies Education - Doctoral Program Requirements \*

### Behavioral Studies

5100:620 Psychology of Instruction for Teaching and Learning	3
or	
5100:624 Seminar: Educational Psychology	3
5100:721 Learning Processes	3
or	
5100:723 Teacher Behavior and Instruction	3

### Humanistic Studies

5100:701 History of Education in American Society	3
or	
5100:703 Seminar: History and Philosophy of Higher Education	3

### Social and Philosophical Studies

5100:600 Philosophies of Education	3
or	
5100:602 Comparative and International Education	3
or	
5100:604 Topical Seminar in the Cultural Foundations of Education	3
5100:705 Seminar: Social-Philosophical Foundations of Education	3

**Research**

5100:640	Techniques of Research	3
5100:741	Statistics in Education	3
5700:899	Doctoral Dissertation	10-20

\*Counseling psychology students contact adviser for requirements.

**Continuous Doctoral Program Enrollment**

All students admitted to the doctoral program must register for a minimum of one semester hour of graduate credit as approved by their advisers during each fall and spring semester. Individual departments may exceed this minimum requirement. Doctoral students should consult their advisers about additional requirements.

**MASTER'S DEGREE**

Programs leading to the degree of M.A. in education, M.S. in education, and M.S. in technical education are offered.

The student who expects to earn the master's degree for advancement in the field of teaching must meet the general requirements for admission to the Graduate School and must be qualified to hold a standard teaching certificate. Exceptions to this latter requirement will be made for the qualified student who does not wish to teach or perform duties in the public schools provided the student presents or acquires an appropriate background of study or experience. The student who expects to earn the master's degree in guidance and administration also should have had successful teaching experience. A physical examination may be required if and when indicated. Any student who exhibits a deficiency in English or other skills may be required to correct it before recommendation for an advanced degree. The student must receive a pass grade on the relevant Master's Comprehensive Exam.

No more than six credits of workshops or institutes can be used to satisfy degree requirements.

The student must complete a minimum of nine credits in foundation studies in education.\*\*

5100:600	Philosophies of Education	3
	or	
5100:602	Comparative and International Education	3
	or	
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:620	Psychology of Instruction for Teaching and Learning	3
	or	
5100:624	Seminar: Educational Psychology	3
5100:640	Techniques of Research	3

\*\* Students in some counseling programs may choose other options – see adviser.

**PROGRAMS**

**Counseling and Special Education**

Selected program offerings in the Department of Counseling and Special Education are available to a person with or without a teaching certificate. Interdisciplinary programs offered lead to certification by the Ohio State Department of Education and/or a master's degree. Program areas include counseling, school psychology, and special education. The person who meets program prerequisites and who has earned a master's degree may matriculate as a non-degree graduate student and pursue a program that leads, in selected areas, to certification.

The Graduate Record Examination (General Test) will be used as the qualifying examination in all Counseling master's programs. The Millers Analogy Test will be used as the qualifying examination in all Special Education master's programs. Admissions to the master's programs will be twice a year (application deadline of March 15 for summer and fall semesters and October 1 for spring semester).

The Council for Accreditation of Counseling and Related Educational Programs (CACREP), a specialized accrediting body recognized by the Commission on Recognition of Postsecondary Accreditation (CORPA), has conferred accreditation on the Community, Marriage and Family, and School Counseling programs.

**Classroom Guidance for Teachers**

This course of study leads to an expanded knowledge of how guidance and counseling services benefit students and others in public school settings. Note that numerous areas of concentration are available to students. This is not a certification program. Any changes in the agreed-upon program must be approved by the student's advisor.

• Foundations Courses (Select one course from each area)		
– Behavioral Foundations		
5100:620	Psychology of Instruction for Teaching and Learning	3
	or	
5100:624	Seminar: Educational Psychology	3
	or	
5600/5100:648	Individual and Family Development Across the Lifespan	3
– Humanistic Foundations		
5100:600	Philosophies of Education	3
	or	
5100:604	Topical Seminar in the Cultural Foundations of Education	3
	or	
5600/5100:646	Multicultural Counseling	3
– Research		
5100:640	Techniques of Research	3
Minimum Foundation Hours Required		9
• Required Departmental Courses		
5600:631	Elementary School Guidance	3
	or	
5600:633	Secondary School Guidance	3
5600:647	Career Development and Counseling Across the Lifespan	3
5600:645	Tests and Appraisal in Counseling	4
5600:610	Counseling Skills for Teachers	3
5600:663	Seminar in School Counseling	3
5600:695	Field Experience (MUST be taken before or concurrently with 663)	1
5610:540	Developmental Characteristics of Exceptional Individuals	3
	or	
5610:604	Education and Management Strategies for Parents of Exceptional Individuals	3
Minimum Department Hours Required		20
• Area of concentration		
An area of concentration with a minimum of six (6) hours may be selected from one of the following areas (the student may, with advisor approval, propose an area of concentration not listed):		
Middle School Education		
Early Childhood Education		
School and Community Relations		
Curriculum and Instruction		
Physical Fitness and Well-Being		
Special Education		
Computers in Education		
Family Ecology		
Communicative Disorders		
Outdoor Education		
Total Area of Concentration Hours Required		6
Minimum Semester Hours Required for Graduation		35

**Community Counseling**

The course of study leads to eventual employment in community mental health centers and a wide variety of other community agencies. Note that a counselor license is usually required by most agencies. (Check counselor licensure elsewhere in this handbook.) Any changes in the agreed upon program must be approved by the student's adviser.

• Foundations (Select one course from each area)		
– Behavioral Foundations		
5600:648	Individual and Family Development	3
– Humanistic Foundations		
5600:646	Multicultural Counseling	3
– Research		
5100:640	Techniques of Research	3
5100:741	Statistics in Education	3
Minimum Foundation Hours Required		9
• Required Counseling Department Courses		
– Professional Orientation		
5600:600	Seminar in Counseling	1
5600:635	Community Counseling	3
	Subtotal	4
– Counseling Theory		
5600:643	Counseling Theory & Philosophy*	3
5600:647	Career Development and Counseling Across the Lifespan	3
	Subtotal	6

– Appraisal		
5600:645	Tests and Appraisal in Counseling Prerequisite: 5100:640	4
	Subtotal	4
– Counseling Process (all required)		
5600:651	Techniques of Counseling*	3
5600:653	Group Counseling Prerequisite 5600:651 and 5600:643	4
5600:675	Practicum in Counseling**† Prerequisite 5600:653	5
	Subtotal	12
– Internship		
5600:685	Internship in Counseling‡ Prerequisite 5600:675	6-7
	Subtotal	6-7
Minimum Department Hours Required		32-33
• Specialized Studies (required)		
5600:620	Topical Seminar: Substance Abuse and Sexuality	2
• Electives (Select a minimum of 6 hours only with help of advisor)		
3750:500	Personality	4
3750:520	Abnormal Psychology	4
3750:530	Psychological Disorders of Children	4
3750:550	Learning and Cognition	4
3750:610	Psychology Core I: Organizational, Social, Applied	4
3750:620	Psychology Core II: Developmental, Perceptual, Cognitive	4
3750:700	Survey of Projective Techniques	4
3750:727	Psychology of Adulthood and Aging	4
3850:511	Social Interaction	3
3850:543	Industrial Sociology	3
5600:620	Topical Seminar	2-3
5600:649	Counseling and Personnel Services in Higher Education	3
5600:655	Marriage and Family Therapy: Theory and Techniques	3
5600:667	Marital Therapy (Prerequisite 5600:655)	3
5600:669	Systems Theory in Family Therapy (Prerequisite 5600:655)	3
5600:695	Field Experience: Master's	1-10
5600:697	Independent Study‡	1-3
5600:720	Topical Seminar	2-3
5610:540	Developmental Characteristics of Exceptional Individuals	4
6400:655	Government and Business	3
6500:654	Industrial Relations	3
7400:607	Family Dynamics	3
	Subtotal	6-7
Minimum Semester Hours Required for Program		50

\*Counseling Theory and Philosophy and Techniques of Counseling may be taken concurrently.  
 \*\*Must sign up with secretary one year in advance.  
 †Must sign up with Internship Coordinator no later than second week of term preceding internship.  
 ‡Independent Study, Field Experience, and Practicum I and II and Internship require closed class permission. You must get one from the Department prior to registering.

**Counseling in Elementary or Secondary Schools**

This course of study leads to eventual employment as a counselor in the public schools. Note that a school counselor must be certified as a teacher and possess three years of teaching experience. Any changes in the agreed upon program must be approved by the student's adviser.

• Foundations (select one course from each area)		
– Behavioral Foundations		
5600:648	Individual and Family Development Across the Life Span	3
– Humanistic Foundations		
5600:646	Multicultural Counseling	3
– Research		
5100:640	Techniques of Research	3
Minimum Foundation Hours Required		9
• Required Counseling Department Courses		
– Professional Orientation (select one course from each area)		
5600:600	Seminar in Counseling	1
5600:631	Elementary School Guidance or	3
5600:633	Secondary School Guidance	3
5600:659	Organization & Administration of Guidance Services	3
	Subtotal	7
– Counseling Theory		
5600:643	Counseling Theory & Philosophy*	3
5600:647	Career Development and Counseling Across the Lifespan	3
	Subtotal	6

– Appraisal		
5600:645	Tests and Appraisal in Counseling Prerequisite: 5100:640	4
	Subtotal	4
– Counseling Process (all required)		
5600:651	Techniques of Counseling*	3
5600:653	Group Counseling Prerequisite 5600:651 and 5600:643	4
5600:675	Practicum in Counseling**† Prerequisite 5600:653	5
	Subtotal	12
– Internship		
5600:685	Internship in Counseling‡† (minimum 6 hours) Prerequisite 5600:675	6-7
	Subtotal	6-7
Minimum Department Hours Required		35-36
• Specialized Studies (both required)		
5610:540	Developmental Characteristics of Exceptional Individuals	3
5600:620	Topical Seminar: Substance Abuse and Sexuality	2
	Subtotal	5
Total Semester Hours Required for Graduation		49-50

\*Counseling Theory and Philosophy and Techniques of Counseling may be taken concurrently.  
 \*\*Must sign up with Secretary one year in advance.  
 †Must sign up with Internship Coordinator no later than second week of term preceding internship.  
 ‡Independent Study, Field Experience, Practicum, and Internship require closed class permission. You must get one from the Department office prior to registering.

**Marriage and Family Therapy**

This course of study leads to eventual employment in family-based mental health settings. Note that in order to practice counseling in Ohio you must possess a counselor license. Any changes in the agreed upon program must be approved by the student's adviser.

• Foundations (select one course from each area)		
– Behavioral Foundations		
5600:648	Individual and Family Development	3
– Humanistic Foundations		
5600:646	Multicultural Counseling	3
– Research		
5100:640	Techniques of Research	3
5100:741	Statistics in Education	3
Minimum Foundation Hours Required:		
	Subtotal	9
• Required Counseling Department Courses (all required)		
– Professional Orientation		
5600:600	Seminar in Counseling***	1
5600:655	Marriage and Family Therapy: Theories and Techniques	3
	Subtotal	4
– Counseling Theory		
5600:667	Marital Theory (prerequisite 5600:655)	3
5600:669	Systems Theory in Family Therapy (prerequisite 5600:655)	3
5600:643	Counseling Theory and Philosophy	3
5600:647	Career Development and Counseling Across the Life Span	3
	Subtotal	12
– Appraisal		
5600:645	Tests and Appraisal in Counseling	4
	Subtotal	4
– Counseling Process		
5600:651	Techniques of Counseling*	3
5600:653	Group Counseling (prerequisites 5600:651 and 655)	4
5600:675	Practicum in Counseling (prerequisite 5600:653) †	5
	Subtotal	12
– Internship		
5600:685	Internship in Counseling (2 terms, prerequisite 5600:675)**	6-7
	Subtotal	6-7
Minimum Department Hours Required		38-39
• Specialized Studies		
– Family Studies		
(Required)		
7400:651	Family and Consumer Law	3
(choose two of the following)		
7400:602	Family with Life Span Perspective	2
7400:605	Developmental Parent-Child Interactions	3
7400:675	Conceptual Frameworks in Family Ecology	3

– Sexuality (choose one)		
5600:620	Substance Abuse and Sexuality	2
7400:542	Human Sexuality	3
– Human Development and Individual Differences (choose one)		
3750:500	Personality	4
3750:520	Abnormal Psychology	4
3750:530	Psychological Disorders of Children	4
3750:550	Learning and Cognition	4
5100:721	Learning Processes	3
7400:665	Development in Infancy and Early Childhood	3
Minimum Specialized Studies Required		13-16
Minimum Hours for Marriage and Family Therapy		60-64

\*\*A minimum of 500 client contact hours must be completed by the end of internship.

\*\*\*Must be taken no later than the second term of the program.

<sup>a</sup> Counseling Theory and Philosophy and Techniques of Counseling may be taken concurrently.

<sup>b</sup> Must sign up with Secretary one year in advance.

### School Psychologist\*

• College requirements:		
5100:640	Techniques of Research	3
5620:694	Research Project	2
	or	
5620:698	Master's Problem	2-4
	or	
5620:699	Master's Thesis	4-6
Departmental requirements:		
5600:643	Counseling: Theory and Philosophy	3
• Program requirements:		
3750:530	Psychological Disorders of Childhood	4
3750:700	Survey of Projective Techniques	4
3750:712	Principles and Practice of Individual Intelligence Testing	4
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:624	Seminar in Human Learning	3
5100:741	Statistics in Education	3
5620:600	Seminar: Role and Function of School Psychology	3
5620:602	Behavioral Assessment	3
5620:610	Educational Diagnosis for the School Psychologist	4

### Sixth-Year School Psychology Master's Degree and Certification Program

• Foundations requirements:		
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:624	Seminar: Educational Psychology	3
5100:640	Techniques of Research	3
5100:741	Statistics in Education	3
• Professional requirements:		
3750:700	Survey of Projective Techniques	4
3750:530	Psychological Disorders of Childhood	4
3750:712	Principles and Practices of Individual Intelligence Testing	4
5600:643	Counseling: Theory and Philosophy	3
5620:600	Seminar: Role and Function of School Psychology	3
5620:602	Behavioral Assessment	3
5620:610	Educational Diagnosis for the School Psychologist	4
5620:694	Research Project in Special Area	2-3
	or	
5620:698	Master's Problem	2-4
	or	
5620:699	Master's Thesis	4-6

The student completing the master's program who desires Ohio certification must additionally complete the following listed certification/professional course requirements including the full academic year internship experience:

3750:500	Personality	4**
5610:543	Developmental Characteristics of Learning Disabled Individuals	3
	or	
5250:683	Reading Diagnosis: School Psychology and Support Personnel	3
5610:540	Developmental Characteristics of Exceptional Individuals	3**
	or	
3750:520	Abnormal Psychology	3**
5620:601	Cognitive Function Models: Principles of Educational Planning	3
5620:603	Consultation Strategies for School Psychology	3
5620:611	Practicum in School Psychology (this course is repeated once for a total of eight credits)	4

The nine-month, full-time internship, and the associated seminars entail the following registration:

5620:630	Internship: School Psychology	3
5620:631	Internship: School Psychology	3
5620:640	Field Seminar I: Professional Topics/Issues in School Psychology	3
5620:641	Field Seminar II: Low Incidence/Related Inquiries	3

The student who does not hold a valid Ohio teaching certificate must additionally complete the following course pattern:

5200:630	Elementary School Curriculum and Instruction	2
5620:695/696	Field Experience: Master's	3
5700:631	Elementary School Administration	2
	or	
5700:601	Principles of Educational Administration	

The student completing the above listed program will be recommended for Ohio certification if his/her credit pattern numbers 60 graduate semester credit hours, counting no more than 15 semester hours at the 500 level, and including the 10 hours credit for the internship and the associated intern seminars.

\*Program admission is competitive based upon state internship allocations. Selection procedures and criteria are available upon request by calling the school psychology program director in the Department of Counseling and Special Education. For recommendation for certification as a school psychologist in Ohio, the master's student must additionally complete the program prescribed under "Certification"

\*\*Required as part of Special Education master's.

### Special Education

The graduate program in special education is designed for those individuals holding an undergraduate degree in special education. Applicants who do not hold such a degree may be admitted to graduate study in special education as Non-Degree admissions until 12 graduate credits of "B" or better are completed.

No more than six hours of 500-level graduate coursework or six hours of work-shop credit at the graduate level may be included in the minimum master's degree program in special education.

The master's degree program in special education is a cross categorical focus with emphases on master's teaching, curriculum design, research, program development, and clinical practice. The minimum program is 39 semester hours. Additional hours are necessary for the completion of the Supervisor's Certificate. The required additional coursework for this certificate is specified below.

It is important that an appointment be made with the student's assigned adviser very early in his or her graduate studies. A signed contract specifying the student's program and timeline for completion must be completed with the adviser by the time the student has earned nine hours of graduate coursework.

Additional hours are also necessary for teacher certification in special education. The adviser will assist in program planning.

All requirements must be completed within six years after beginning graduate-level coursework at The University of Akron or elsewhere.

• Foundation core (nine credits):		
5100:600	Philosophies of Education	3
	or	
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:620	Psychology of Instruction for Teaching and Learning	3
	or	
5100:624	Seminar: Educational Psychology	3
5100:640	Techniques of Research	3
• Departmental core (21 credits):		
5600:610	Counseling Skills for Teachers	3
5610:601	Seminar: Curriculum Planning in Special Education	3
	or	
5610:605	Program Development and Service Delivery Systems in Special Education	3
5610:606	Research Design and Practice in Special Education	3
5610:603	Assessment and Educational Programming in Special Education*	3
5610:604	Education and Management Strategies for Parents of Exceptional Individuals*	3
5610:612	Issues in Special Education	3
• Department: Master's Papers (choose three credits):		
5610:694	Research Project in Special Area (Scholarly Paper)	3
5610:698	Master's Problem: Special Education	3
5610:699	Master's Thesis	3

- Electives (minimum of nine credits)
- Completion of at least nine hours with the approval of your major adviser. (May include a directed field experience.)
- Certification: Special Education Supervisor.

The supervisor's certificate may be issued to a holder of a master's degree, plus 27 months teaching experience in the area to be supervised and completion of the following coursework:

5100:600	Philosophies of Education	3
5100:620	Psychology of Instruction for Teaching and Learning	3
5100:640	Techniques of Research*	3
5700:610	Principles of Education Supervision	3
5700:609	Principles of Curriculum Development	3

5610.601	Seminar: Curriculum Planning in Special Education	3
5610.602	Supervision of Instruction in Special Education	3
5700.695	Field Experience for Supervisors	3
5700.740	Theories of Educational Supervision	

\*May be waived if completed as undergraduate.

## Educational Foundations and Leadership

### Educational Administration

The Department of Educational Administration and Leadership offers a master's degree program in general administration which is not directed toward a particular administrative or supervisory certificate. With the help of an adviser and approval of the Graduate School, courses may be substituted and/or waived to create specialized options. Requirements of the standard program and examples of two such specialized programs are listed below:

#### General Administration (Standard Program)

- Foundation Studies – nine credits.

#### • Required courses:

5700.601	Principles of Educational Administration	3
5700.603	Administration of Educational Personnel	2
5700.606	Evaluation in Educational Organizations	3
5700.607	School Law	2
5700.608	School Finance and Economics	3
5700.615	Computer Applications in Educational Administration	2
5700.684	Field Experience I: Elementary Administration	2
	or	
5700.686	Field Experience II: Secondary Administration	2
	or	
5700.895	Field Experience I: The Superintendency	2
5700.706	Collective Bargaining and Employee Relations	2
5700.707	The Superintendency	3

#### Higher Education Administration (Specialized Option)

All applicants to the program should have previously earned a bachelor's degree. Special admission for concurrent studies toward a master's degree and the higher education certificate may be allowed for persons currently employed in higher education. Students interested in admission should first meet with the program coordinator. Persons wishing to pursue a master's degree in Educational Administration-Higher Education Option must, however, also apply to the Graduate School for admission to the program. Applicants wishing to pursue only the certificate program must apply to the Graduate School for admission as a special non-degree student.

- Foundation studies – nine credits.

#### • Required courses (25 credits):

5190.500	Introduction to the Study of Higher Education	3
5190.515	Administration in Higher Education	3
5190.521	Law and Higher Education	3
5190.620	Finance and Higher Education	3
5190.626	Student Services and Higher Education	3
5190.527	The American College Student	3
	or	
5190.525	Topical Seminar: Higher Education	3
5190.530	Higher Education Curriculum and Program Planning	3
5190.600	Advanced Administrative Colloquium in Higher Education	1
5190.601	Internship in Higher Education	2
5190.602	Internship in Higher Education Seminar	1

Total Hours Required: 34.

#### • Electives:

5190.626	Organizational and Policy Development in Higher Education	3
5190.635	Instructional Strategies and Techniques for the College Instructor	3
5190.645	Independent Study in Higher Education	1-3
5190.590	Workshop	3-6

#### School Treasurer (Specialized Option)

- Foundation studies – nine credits.

#### • Required courses:

5700.602	School Business Administration	2
5700.607	School Law	2
5700.608	School Finance and Economics	3
5700.697	Independent Study in School Fiscal Management	3
5700.706	Collective Bargaining and Employee Relations	2
5700.707	The Superintendency	3
5700.795/796	Internship	
6200.601	Financial Accounting	3
6200.649	State and Local Taxation	2

## Elementary School Principal

### Objectives

- Provide the student with an understanding of the elementary school and its history, its present purpose, and its potential.
- Assist the prospective administrator in perceiving the role of the elementary principal and determining whether it is appealing as a career choice.
- Provide the student with the opportunity to experiment with alternate leadership styles in order to determine how the student might best lead.
- Coordinate classroom activities with field experiences in order to exercise the student's administrative skills and test the student's ability to relate understandings to performance.

### Program

- Foundation Studies – nine credits.

#### • Administration courses:

5200.630	Elementary School Curriculum and Instruction	2
5200.732	Supervision of Instruction in the Elementary School	2
5700.601	Principles of Educational Administration	3
5700.607	School Law	2
5700.610	Principles of Educational Supervision	3
5700.613	Administration of Pupil Services	2
5700.615	Computer Applications in Educational Administration	2
5700.631	Elementary School Administration	3
5700.684	Field Experience I: Elementary Administration	2

### Post-Master's Degree Requirements for Ohio Certification as an Elementary School Principal:

5700.603	Administration of Educational Personnel	2
5700.604	School-Community Relations	3
5700.606	Evaluation in Educational Organizations	3
5700.608	School Finance and Economics	3
5700.694	Field Experience II: Elementary Administration	3
5700.706	Collective Bargaining and Employee Relations in Education	2

- Total for Certification: 46 credits.

## Secondary School Principal

### Objectives

- Enable the student to gain a knowledge of the overall curriculum of the secondary school.
- Provide the student with an understanding of successful methods of improving instruction in the secondary school.
- Provide the student with practice in implementing a program to improve instruction.
- Develop within each student the ability to communicate successfully with individuals and groups.
- Work with the individual and the group successfully to improve the educational program.
- Implement technical aspects of secondary education.

### Program

- Foundation Studies courses – nine credits.

#### • Administration courses:

5300.619	Secondary School Curriculum and Instruction	2
5300.721	Supervision of Instruction in the Secondary School	2
5700.601	Principles of Educational Administration	3
5700.607	School Law	2
5700.610	Principles of Educational Supervision	3
5700.613	Administration of Pupil Services	2
5700.615	Computer Applications in Educational Administration	2
5700.620	Secondary School Administration	3
5700.686	Field Experience I: Secondary Administration	2

### Post-Master's Degree Requirements for Ohio Certification as a Secondary School Principal:

5700.603	Administration of Educational Personnel	2
5700.604	School-Community Relations	3
5700.606	Evaluation in Educational Organizations	3
5700.608	School Finance and Economics	3
5700.696	Field Experience II: Secondary School Administration	3
5700.706	Collective Bargaining and Employee Relations in Education	2

- Total for Certification: 46 credits.

**Administration Specialists**

The Department of Educational Administration and Leadership offers programs leading to each of the seven Educational Administrative Specialist certificates granted by the Ohio Department of Education.

Each of these specialist certification programs consists of a master's degree program and a post-master's block. In the individual program listings below, master's degree requirements are marked with a single asterisk (\*) and post-master's requirements are indicated by double asterisks (\*\*).

**Administrative Specialist: Business Management**

• Foundation Studies – nine credits.\*

• Required courses:

5700:601	Principles of Educational Administration*	3
5700:602	School Business Administration**	2
5700:603	Administration of Educational Personnel*	2
5700:606	Evaluation in Educational Organizations	3
5700:607	School Law*	2
5700:608	School Finance and Economics*	3
5700:612	Administration of Educational Facilities	2
5700:615	Computer Applications in Educational Administration	2
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3
5700:895	Field Experience: The Superintendency*	2
5700:897	Independent Study: Business Management**	3
6200:601	Financial Accounting**	3
6500:600	Management and Production Concepts**	3

**Administrative Specialist: Educational Research**

• Foundation Studies – nine credits.\*

• Required courses:

5100:642	Topical Seminar: Measurement and Evaluation**	3
5100:741	Statistics in Education**	3
5100:743	Advanced Educational Statistics**	3
5100:801	Research Seminar**	3
5100:897	Independent Study: Educational Research**	1
5700:601	Principles of Educational Administration*	3
5700:603	Administration of Educational Personnel*	2
5700:606	Evaluation in Educational Organizations*	3
5700:607	School Law*	2
5700:608	School Finance and Economics*	3
5700:615	Computer Applications in Educational Administration*	2
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3

**Administrative Specialist: Educational Staff Personnel Administration**

• Foundation Studies – nine credits.\*

• Required courses:

5700:601	Principles of Education Administration*	3
5700:603	Administration of Educational Personnel*	2
5700:606	Evaluation in Educational Organizations*	3
5700:607	School Law*	2
5700:608	School Finance and Economics*	3
5700:610	Principles of Educational Supervision**	3
5700:615	Computer Applications in Educational Administration	2
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:704	Advanced Principles of Educational Administration**	3
5700:705	Decision-Making in Educational Administration**	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3
5700:895	Field Experience: The Superintendency**	2
6500:654	Industrial Relations**	3

**Administrative Specialist: Instructional Services**

• Foundation Studies – nine credits.\*

• Required courses:

5200:630	Elementary School Curriculum and Instruction**	2
5300:619	Secondary School Curriculum and Instruction**	2
5700:601	Principles of Educational Administration*	3
5700:603	Administration of Educational Personnel*	2
5700:606	Evaluation in Educational Organizations*	3
5700:607	School Law*	2
5700:608	School Finance and Economics*	3
5700:609	Principles of Curriculum Development**	3
5700:610	Principles of Educational Supervision**	3
5700:615	Computer Applications in Educational Administration*	2
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:697	Independent Study: Instructional Services**	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3
5700:895	Field Experience: The Superintendency**	2

**Administrative Specialist: Pupil Personnel Administration**

• Foundation Studies – nine credits.\*

• Required courses:

5600:631	Elementary Counseling**	3
	or	
5600:633	Secondary Counseling**	3
5600:645	Group Testing**	3
5600:659	Organization and Administration of Guidance Services**	3
5700:601	Principles of Educational Administration*	3
5700:603	Administration of Educational Personnel*	2
5700:606	Evaluation in Educational Organizations*	3
5700:607	School Law*	2
5700:608	School Finance and Economics*	3
5700:613	Administration of Pupil Services**	2
5700:615	Computer Applications in Educational Administration*	2
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3
5700:895	Field Experience: The Superintendency**	2

**Administrative Specialist: School and Community Relations**

• Foundation Studies – nine credits.\*

• Required courses:

5700:601	Principles of Educational Administration*	3
5700:603	Administration of Educational Personnel*	2
5700:604	School-Community Relations**	3
5700:606	Evaluation in Educational Organizations*	3
5700:607	School Law*	2
5700:608	School Finance and Economics*	3
5700:615	Computer Applications in Educational Administration*	2
5700:620	Secondary Administration*	3
5700:631	Elementary Administration*	3
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3
5700:895	Field Experience: The Superintendency**	2
7600:625	Theories of Mass Communication**	3
7600:628	Contemporary Public Relations Theory**	3

**Administrative Specialist: Special Education (Exceptional Children)**

• Foundation Studies – nine credits.\*

• Required courses:

5610:540	Developmental Characteristics of Exceptional Individuals**	3
5610:601	Seminar: Curriculum Planning*	3
5610:602	Supervision of Instruction: Special Education**	3
5610:605	Program Development and Delivery Systems**	3
5610:697	Independent Study: Exceptional Children**	1

5700:601	Principles of Educational Administration*	3
5700:603	Administration of Educational Personnel*	2
5700:606	Evaluation in Educational Organizations*	3
5700:607	School Law*	
5700:608	School Finance and Economics*	3
5700:615	Computer Applications in Educational Administration*	2
5700:684	Field Experience I: Elementary Administration*	2
	or	
5700:686	Field Experience I: Secondary Administration*	2
	or	
5700:695	Field Experience for Supervisors*	3
5700:706	Collective Bargaining and Employee Relations*	2
5700:707	The Superintendency*	3
5700:895	Field Experience: The Superintendency**	2

## Assistant Superintendent/Superintendent Programs

There is significant overlap in the requirements of these two programs. A person entering the assistant superintendent program must already have an administrator or supervisor certificate. Both teaching and administrative experience is required for superintendent certification.

### Assistant Superintendent

- Foundation Studies – nine credits.

- Required courses – master's:

5700:601	Principles of Educational Administration	3
5700:606	Evaluation in Educational Organizations	3
5700:607	School Law	2
5700:608	School Finance and Economics	3
5700:609	Principles of Curriculum Development	3
5600:610	Principles of Educational Supervision	3
5700:613	Administration of Pupil Services	2
5700:615	Computer Applications in Educational Administration	2
5700:707	The Superintendency	3

- Required courses – post-master's:

5700:602	School Business Administration	2
5700:603	Administration of Educational Personnel	2
5700:604	School-Community Relations	3
5700:612	Administration of Educational Facilities	2
5700:706	Collective Bargaining and Employee Relations	2
5700:895	Two field experiences are required	4-5

### Superintendent

- All of the assistant superintendent requirements plus:

5700:704	Advanced Principles of Educational Administration	2
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- Electives, as needed, to bring the program to a total of 60 graduate semester hours.

\*Required only of an elementary student.

\*\*Required only of a secondary student.

†Required only of a special education student.

## Supervisor

- Foundation Studies – nine credits.

- Major field:

5200:630	Elementary School Curriculum and Instructions*	2
5200:732	Supervision of Instruction in the Elementary School*	2
5300:619	Secondary School Curriculum and Instruction**	2
5300:721	Supervision of Instruction in the Secondary School**	2
5610:601	Seminar: Special Education Curriculum Planning†	3
5610:602	Supervision of Instruction: Special Education†	3
5700:609	Principles of Curriculum Development	3
5700:610	Principles of Educational Supervision	3
5700:695	Field Experience for Supervisors	3
5700:740	Theories in Educational Supervision	3

- Electives – With the approval of the adviser, the student will select at least one of the following courses and others to fulfill the program minimum of 30 credits:

5100:701	History of Education in American Society	3
5100:741	Statistics in Education	3
5700:698	Master's Problem	2

\*Required only of an elementary student.

\*\*Required only of a secondary student.

†Required only of a special education student.

## Educational Foundations

This Master's degree program area is designed for either the student interested in improving present educational skills or the student interested in educational or instructional positions in business, industry, and social services.

The student's program of study will be determined jointly by the student and advisor. Emphasis can range from advanced instructional technology to studies in educational psychology or the social/philosophical aspects of education. The student can elect to include a thesis or master's problem or take an additional six semester hours of course work.

- Foundation Studies – College Core Foundation Studies (nine hours).
- Departmental Requirements – minimum of 21 hours.
- Outside Departmental – minimum of six hours.
- Master's comprehensive exam.

### Master's Emphasizing Instructional Technology

- Foundation Core (College Requirement – nine hours)
- Departmental Requirements – with your advisor's approval, a minimum of 12 hours from the following:

5100:520	Introduction to Instructional Computing	3
5100:512	Design and Production of Instructional Materials	3
5100:590	Workshop in Instructional Technology	3
5100:630	Topical Seminar in Computer-Based Education (may be repeated)	3
5100:636	Topical Seminar in Educational Technology (may be repeated)	3
5100:614	Planning for Technology	3
5100:695	Field Experience: Master's	1-3
5100:696	Master's Technology Project	2-3
5100:697	Independent Study: Master's	1-3

- Other Requirements – a minimum of six hours, with your advisor's approval, related to Instructional Technology, from outside the Department.

- Thesis/Master's Problem Option (minimum program total of 30 semester hours):

5100:698	Master's Problem	3-4
	or	
5100:699	Master's Thesis	4-6

- Non-Thesis/Master's Problem Option (minimum program total of 30 semester hours):

Additional course work in the area of educational technology selected jointly by the student and the advisor for a minimum program total of 36 semester hours.

## Elementary Education

### Bilingual Multicultural Education

The major purpose of this program is to provide education majors with the knowledge, skills and attitudes necessary to teach bilingual students.

Students may become certified in bilingual multicultural education at either the undergraduate or graduate level. The certification requires that a person also become certified in one of the following areas: elementary education, secondary education, special education, or physical education.

At the end of the program, the student must demonstrate proficiency in English and a language other than English in order to meet the certification requirements of the Ohio State Department of Education.

Graduate students wishing a master's degree in addition to bilingual multicultural certification may earn a master's degree in multicultural education by taking additional coursework.

The program incorporates coursework in the history and philosophy of bilingual multicultural education; linguistics; English as a second language instruction; culture and theories; and practices for teaching bilingual students language arts, reading, mathematics, social studies and science.

- Program requirements:

3300:589	Seminar in English: Introduction to Bilingual Linguistics	3
5630:582	Characteristics of Culturally Diverse Populations	3
5630:584	Principles of Bilingual Multicultural Education	3
5630:587	Techniques for Teaching English as a Second Language in the Bilingual Classroom	4
	Field Experience in Bilingual Classrooms/Settings	3

- Select one of the following:

5630:585	Teaching Reading and Language Arts to Bilingual Students	4
5630:586	Teaching Mathematics, Social Studies and Science to Bilingual Students	3

### Multicultural Education

The purpose of this program is to provide knowledge, skills and attitudes which will enable the educator to design and implement programs that promote the concept of cultural pluralism. Special attention is given to educational programming for the culturally different learner.

- Required Courses:

5100:640	Techniques of Research	3
5300:780	Seminar in Secondary Education*	4
5600:645	Group Testing in Counseling	3
5630:581	Multicultural Education in the United States	3

5630:582	Characteristics of Culturally Diverse Populations	3
5630:686	Seminar: Education of the Culturally Different	2

• Electives in related special fields – 17 credits.

\*Two seminars are required.

### Elementary Education

Students seeking a master's degree in elementary education can follow several options. A 30-credit program is available for students who contemplate pursuing the Ph.D. in the future. This 30-credit program includes the completion of a master's thesis under the direction of a faculty adviser. The thesis provides the student with research/scholarly writing experiences that form the foundation for further study at the doctoral level.

#### 30 Credit Option

• Foundation studies – nine credits.

• Elementary Education:

5200:538	Materials and Laboratory Techniques in Elementary School Mathematics	3
5200:630	Elementary School Curriculum and Instruction	2
5200:631	Trends in Elementary Education	2
5250:680	Trends in Reading Instruction	2
5200:699	Master's Thesis	4-6
5200:780	Seminar in Elementary Education (two seminars required)	4

• Electives: Total to fulfill program minimum of 30 credits and to be taken from 5200, 5250, or 5630 coursework. 2-4

For persons wishing to gain further knowledge of the elementary school curriculum and remain in the elementary classroom, the 36-credit program is available. This program requires a field experience that provides an opportunity for the teacher to experiment with newly acquired skills and knowledge under the direction of a faculty adviser.

#### 36 Credit Option

• Foundation studies – nine credits.

• Elementary Education:

5200:538	Materials and Laboratory Techniques in Elementary School Mathematics	3
5200:630	Elementary School Curriculum and Instruction	2
5200:631	Trends in Elementary Education	2
5250:680	Trends in Reading Instruction	2
5200:695, 696	Field Experience: Master's	2
5200:780	Seminar in Elementary Education	2

• Electives: Total to fulfill program minimum of 36 credits. Electives may be taken in one concentrated area or from several areas, but must contain courses from 5200, 5250, or 5630 as listed in the bulletin.

### Middle School Education

For elementary and secondary certified teachers, these courses comprise a major area of study within the master's programs in the elementary and secondary education departments. They deal with the middle-grade learner, curriculum and programs. The student should seek advisement within the appropriate department for other requirements peculiar to the elementary and secondary programs.

• Required courses:

5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:624	Seminar: Educational Psychology	3
5200:780	Curriculum Development in Middle School	2
5300:625	Reading Programs in Secondary School	3
5300:780	Philosophy and Organization of Middle School	2
5600:526	Career Education/Guidance in Middle School	2

### Reading

The master's degree is designed for early childhood, elementary, junior high, middle, secondary content, secondary developmental, and special education teachers working in a diagnostic-prescriptive, clinical, or adult program. The programs of study provide opportunities to study those aspects of reading that relate to the professional goals and interests of the student.

The 30-credit option is designed for students who contemplate pursuing a doctoral program in the future; this option requires a thesis. The 36-credit option is designed for students who wish to enhance their knowledge of reading instruction and remain in a classroom setting to use their newly acquired knowledge. This program requires a field experience under the direction of a member of the elementary education faculty.

Neither of these degree options lead to certification in reading in Ohio. Persons wishing this certification must complete additional courses as specified below.

#### 30 Credit Option

• Foundation studies – nine credits.

• Reading:

5200:699	Master's Thesis	4-6
5200:780	Seminar in Elementary Education: Children's Literature	2
5250:540	Developmental Reading in the Content Areas – Elementary	3
5250:680	Trends in Reading Instruction	2
5250:681	Diagnosis and Correction of Reading Problems	5
5250:682	Clinical Practices in Reading	5

#### 36 Credit Option

• Foundation studies – nine credits

• Reading

5200:695, 696	Field Experience: Master's	2
5200:780	Seminar in Elementary Education: Children's Literature	2
5250:540	Developmental Reading in the Content Areas – Elementary	3
5250:680	Trends in Reading Instruction	2
5250:681	Diagnosis and Correction of Reading Problems	5
5250:682	Clinical Practices in Reading	5
5250:692	Advanced Study and Research in Reading Instruction	3
5250:693	Supervision and Curriculum Development in Reading Instruction	2

### Physical Education and Health Education

#### Athletic Training for Sports Medicine

The Athletic Training program, requiring 35 credits, is designed primarily for students having an undergraduate degree in the same area. Students may become involved in supervising university undergraduates, working with athletic teams, and other clinical experience both on and off campus. Students interested in this program should not assume they are automatically admitted into it. Admission is based on an interview process conducted by the athletic trainer staff. If interested in this program, you should contact the head athletic trainer (MH-77 ext. 6056) as soon as possible so that you can be fully apprised of your individual situation.

• Foundation Courses:

5100:640	Techniques of Research	3
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• Required Courses

3100:561	Human Physiology	4
3100:562	Human Physiology	4
3100:565	Advanced Cardiovascular Physiology	3
5550:605	Physiology of Muscular Activity and Exercise	3
5550:606	Statistics: Qualitative and Quantitative Methods	3
5550:541	Advanced Athletic Injury Management	4
5550:542	Therapeutic Modalities and Equipment in Sports Medicine	3
5550:680	Special Topics: Pharmacology for Sports	3

At least two (2) credit hours from the following:

5550:695	Field Experience: Master's	2-6
	or	
5550:698	Master's Problem	2-4
	or	
5550:699	Master's Thesis	4-6

• Electives to be taken with permission of the adviser (at least one course from among the following is required):

5100:520	Introduction to Instructional Computing	3
5550:536	Foundations and Elements of Adapted Physical Education	3
5550:555	Motor Development of Special Populations	3
5550:601	Supervision and Administration of Physical and Health Education, Recreation and Dance	3
5550:609	Motivational Aspects of Physical Activity	3
5550:680	Special Topics: Laboratory Instrumentation	3
7400:587	Sports Nutrition	3

Students who enter the NATA program with undergraduate training in the required courses listed above (section II) will take course work from the electives listed (after consultation with their adviser) in a number sufficient to meet the 35 hour program requirement.

### Outdoor Education

The outdoor education program, requiring 32 credits, is designed for those students having an undergraduate background in elementary or secondary education, biology, environmental studies, health, physical education or recreation. Students may become involved with existing outdoor education programs in the public schools, metropolitan, state and national park programs, or private and public agencies which conduct outdoor/environmental education programs.

• Foundation Studies – nine credits.

• Required Foundation Courses:

5100:640	Techniques of Research	3
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Remaining six (6) credits to be chosen, with approval of adviser, from 5100:500 or 5100:600 course offerings or 5550:606 *Statistics: Qualitative and Quantitative Methods*.

## • Required courses:

5560:550	Application of Outdoor Education to the School Curriculum	4
5560:552	Resources and Resource Management for the Teaching of Outdoor Education	4
5560:556	Outdoor Pursuits	4
	or	
5560:605	Outdoor Education: Special Topics	2-4
5560:600	Outdoor Education: Rural Influences	3
5560:695	Field Experience (at least 2 credits if only option selected)	2-6
	or	
5560:698	Master's Problem	2-4
	or	
5560:699	Master's Thesis	4-6

With the approval of the adviser, the student will select additional courses and/or workshops related to the graduate program.

## Physical Education

The graduate program in physical education, requiring 33 credits, is designed for post-baccalaureate and in-service physical educators. The theme of the program is "physical educator as decision-maker." Training received in this program comes from two (2) areas: the foundations (6 cr.) and the program studies area of physical education (25 cr.). The emphasis in this curriculum is to provide answers to the questions "what I can learn about teaching and what decisions do I face as a professional educator." Successful completion of this program would meet a tenure requirement for Ohio public schools as well as for other states. Each student will be assigned an adviser who should be consulted with on a regular basis. In fact, adviser approval is required on certain course work.

## • Required Foundation Courses:

5100:600	Philosophies of Education	3
	or	
5100:604	Topical Seminar in the Cultural Foundations of Education	3
	or	
5100:620	Psychology of Instruction for Teaching and Learning	3
	or	
5100:624	Seminar: Educational Psychology	3
5100:640	Techniques of Research	3
	Subtotal	6

## • Required Department Courses:

5550:536	Foundations and Elements of Adapted Physical Education	3
5550:601	Supervision and Administration of Physical and Health Education, Recreation and Dance	3
5550:602	Motor Behavior	3
	or	
5550:604	Current Issues in Physical Education	3
5550:603	Physical and Health Education: Instructional Strategies	3
5550:605	Physiology of Muscular Activity and Exercise	3
5550:606	Statistics: Qualitative and Quantitative Methods	3
5550:609	Motivational Aspects of Physical Activity	3
5570:521	Comprehensive School Health	4
5550:695	Field Experience: Master's	2 (minimum)
	or	
5550:698	Master's Problem	2 (minimum)
	or	
5550:699	Master's Thesis	2 (minimum)
	Total Program	33

With the approval of an adviser, the student may select additional courses and/or workshops related to the graduate program.

### Option: Adapted Physical Education

The Adapted Physical Education option is designed for advanced study about teaching physical education to disabled individuals. Emphasis is given to a developmental model using assessment and programming of motor skills which lead to increased educational, social, vocational, and lifetime fitness development. The program combines research and clinical/field experiences to provide schools and agencies with expertise needed to improve their programs. A minimum of 34 graduate credits is required. Completion of this program will also afford the student an Ohio validation for teaching this content area.

## • Required Foundation Courses:

5100:600	Philosophies of Education	3
	or	
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:620	Psychology of Instruction for Teaching and Learning	3
	or	
5100:624	Seminar: Educational Psychology	3
5100:640	Techniques of Research	3
	Subtotal	9

## • Required Department Courses:

5550:536	Foundations and Elements of Adapted Physical Education	3
5550:551	Assessment and Evaluation in Adapted Physical Education	3
5550:555	Motor Development of Special Populations	3
5550:605	Physiology of Muscular Activity and Exercise	3
5550:606	Statistics: Qualitative and Quantitative Methods	3

5550:695	Field Experience: Master's	2
5610:565	Neuromotor Aspects of Physical Disabilities	3
5610:567	Management of Strategies in Special Education	3

## • At least two (2) credits from among the following:

5550:695	Field Experience: Master's	2-6
	or	
5550:698	Master's Problem	2-4
	or	
5550:699	Master's Thesis	4-6

### Option: Exercise Physiology/Adult Fitness

This graduate program, requiring a minimum of 34 credits, is designed to prepare students for advanced study in exercise physiology and future employment in adult fitness, corporate fitness and cardiac rehabilitation programs. Special attention is also given to knowledge and practical skills necessary for students preparing for American College of Sports Medicine certifications.

## • Required Foundation Courses:

5100:620	Psychology of Instruction for Teaching and Learning	3
	or	
5100:624	Seminar: Educational Psychology	3
5100:640	Techniques of Research	3
	Subtotal	6

## • Required Department Courses:

3100:561	Human Physiology	4
3100:562	Human Physiology	4
3100:565	Advanced Cardiovascular Exercise	3
5550:605	Physiology of Muscular Activity and Exercise	3
5550:606	Statistics: Qualitative and Quantitative Methods	3
5550:680	Special Topics in Health and Physical Education:	
	Laboratory Instrumentation	3
7400:587	Sports Nutrition	3

## • At least two (2) credits from among the following:

5550:695	Field Experience: Master's	
	or	
5550:698	Master's Problem	
	or	
5550:699	Master's Thesis	2 (minimum)

## • Electives: Select at least one (1) course from among the following and have adviser approval.

5100:520	Introduction to Instructional Computing	3
5100:741	Statistics in Education	3
5100:743	Advanced Education Statistics	3
5550:601	Supervision and Administration of Physical and Health Education, Recreation and Dance	3
5550:609	Motivational Aspects of Physical Activity	3

## Secondary Education

### Middle School Education

For elementary and secondary certified teachers, these courses comprise a major area of study within the master's programs in the elementary and secondary education departments. They deal with the middle-grade learner, curriculum and programs. The student should seek advisement within the appropriate department for other requirements peculiar to the elementary and secondary programs.

## • Required courses:

5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:624	Seminar: Educational Psychology	3
5200:780	Curriculum Development in Middle School	2
5300:625	Reading Programs in Secondary School	3
5300:780	Philosophy and Organization of Middle School	2
5600:526	Career Education Guidance in Middle School	2

### Secondary Education

This program is for middle and junior high school, high school, and post-secondary school teachers. Preparation for the master teacher, department head, supervisor, and resource teacher (the physical education major should see an adviser for alternate course requirements). With minor modification, this program may also serve the holder of a baccalaureate degree who seeks a teaching certificate. For specific information on obtaining initial teaching certification through a master's program, see the department head. The degree requires a minimum of 33 semester hours of graduate work.

## • Foundation Studies – nine credits.

Secondary education course:		
5300:780	Seminar in Secondary Education: Improvement of Instruction (in the area of concentration)	2

## • Ten credits from the following:

5300:619	Secondary Curriculum and Instruction	2
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5300:625	Reading Programs in Secondary Education	3
5300:695	Field Experience	1-6
5300:698	Master's Problem or	
5300:699	Master's Thesis	4-6
5300:721	Supervision of Instruction	2
5300:780	Seminar: Secondary Education* Topics: Senior High Middle and Junior High School* Computer-Based Education Individualized Instruction	2
5400:505	Occupational Education for Youth and Adults	3

• Area of concentration (500 level or above) – 10 credits

\*Only two seminars for this option may be counted toward the degree.

Course selections are made by student and adviser in accord with the student's professional interests. Possible areas of concentration include:

- Subject Matter Specialist* (mathematics, English, etc.)
- Middle school education*
- Economic education*
- Micro-computer applications*

- Electives – two to four credits
- A comprehensive examination is required.

### Secondary Education (Certification)

This program is open to highly qualified students who hold the B.A. or B.S. degree. All requirements for certification must be met including the 600 hours of field and clinical/diagnostic experience.

• Foundation Courses (10 credits):

5100:600	Philosophies of Education or	3
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:620	Psychology of Instruction for Teaching and Learning	3
5100:642	Topical Seminar in Measurement and Evaluation	3
5100:695	Field Experience: Master's	1

• Secondary Education Seminar (2 credits):

5300:780	Seminar in Secondary Education	2
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• Secondary Education (16):

5300:695	Field Experience: Master's	1
5300:530	Instructional and Management Practices	3
5300:619	Secondary School Curriculum and Instruction or	2
5300:721	Supervision of Instruction in the Secondary School or	2
5300:780	Seminar in Secondary Education	2
5300:545	Microcomputer Applications for Secondary Teachers	3
5300:625	Reading Programs in Secondary Schools	3
5300:697	Independent Study	3
5300:695	Field Experience: Master's	1

• Area of Concentration (9):

Select 9 credits at 500-level or above.

• Field Experience (Student Teaching) (7 credits):

5300:695	Field Experience: Master's	6
5300:695	Field Experience: Master's	1

• A comprehensive examination is required.

Total Program: 44

### Technical Education

The major objective of the technical education program is to prepare the instructor and other educational personnel for post-secondary educational institutions, industry, and public and private agencies engaged in the education and training of technicians and middle-level workers.

#### Program

• Foundation Studies – nine credits.

5100:602	Comparative and International Education or	3
5100:604	Topical Seminar in the Cultural Foundations of Education	3
5100:624	Seminar: Educational Psychology (or 5100:620)	3
5100:640	Techniques of Research	3

• Professional Technical Education Courses:

5400:500	Postsecondary Learner	3
5400:530	Systematic Curriculum Design for Technical Education	3
5400:535	Instructional Techniques in Technical Education	3

• Internship:

The student entering the program without teaching experience is required to take a teaching internship at a cooperating two-year institution, business, industry, or related learning organization.

5400:690	Internship in Technical Education	3
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• Elective credits (zero to two credits) may support the field of specialization, add to general education, or be professional education courses.

• A comprehensive examination must be passed.

• A cumulative portfolio will be evaluated as an exit requirement during the internship course.

**Six Options** (Select one for a total of 32-42 credits, depending on option.)

**Teaching Option** (21 credits) (Total credits required for this option - 42)

An approved schedule of career-related courses selected from the Graduate School offerings. Course selections will be determined by the student's academic and professional background.

5400:505	Occupational Education for Youth and Adults or	3
5400:600	The Two-Year College	3

**Guidance Option** (12 credits) (Total credits required for this option - 32)

5600:635	Community Counseling	3
5600:647	Career Development and Counseling Across the Lifespan	3
5600:xxx	(Elective)	3
5400:600	The Two-Year College	3

**Training Option** (12 credits) (Total credits required for this option - 32)

An approved schedule of career-related courses selected from the Graduate School offerings. Course selections will be determined by the student's academic and professional background.

5400:515	Training in Business and Industry	3
5100:642	Topical Seminar in Measurement and Evaluation	3

**Supervision Option** (12 credits) (Total credits required for this option - 32)

5400:605	Advanced Systems Design for Technical Instruction	3
5400:615	Advanced Techniques for Technical Instruction	3
5400:620	Supervision of Technical Instruction	3
5400:505	Occupational Education for Youth and Adults or	3
5400:600	The Two-Year College	3

**Administration Option** (12 credits) (Total credits required for this option - 32)

5400:600	The Two-Year College	3
5400:620	Supervision of Technical Instruction	3
5400:661	Current Issues in Higher Education	3

**Instructional Technology Option** (12 credits) (Total credits required for this option - 32)

5100:630	Topical Seminar in Computer-Based Education	6
5100:636	Topical Seminar in Educational Technology	6

**General Electives** (0-2, depending on choice of options)

# College of Business Administration

Stephen F. Hallam, Ph.D., *Dean*

James E. Inman, J.D., *Associate Dean*

James R. Emore, D.B.A., *Assistant Dean and Director of Undergraduate Programs*

John Daniel Williams, D.B.A., *Assistant Dean and Director of Graduate Programs*

## Mission Statement

The MBA program is the principle graduate program of UA's College of Business Administration. The objective of the MBA program is to provide a diverse group of men and women with the skills, leadership, vision, and innovative spirit needed to rise to positions of organizational leadership in a global business environment characterized by intense competition and rapid rates of technological change. Graduates of UA's MBA program should possess:

The analytical and conceptual abilities needed to identify and cope successfully with ambiguous and unstructured business problems;

A solid grounding in the basic business functions, with an emphasis on the integration of those functions and an understanding of how those functions are linked in the formulation and execution of business strategy;

A strong ethical perspective, an appreciation of cultural diversity, and an ability to communicate in an effective, persuasive manner;

An understanding of the legal, political, regulatory, economic and technological environment; and,

An awareness of the global economy in which business operates and an understanding of the forces that shape competitiveness in that economy.

In order to accomplish these goals, the graduate faculty of the College of Business Administration commits itself to providing a quality graduate business experience. That experience will have a strong professional focus, characterized by team work among students. The faculty is dedicated to creating an intense and stimulating environment that emphasizes the application of theory to real managerial problems and that is permeated by the basic concepts of globalization, ethics, leadership, and planned change.

We recognize that there are many skills students need to acquire in their MBA program in addition to technical competencies in their field of concentration. These include communication and interpersonal skills, analytical reasoning and leadership skills. Eight of these "expanded" competencies to be intertwined throughout the program are as follows:

### Communication

1. Ability to present views and concepts clearly in writing;
2. Ability to read, critique, and judge the value of written work;
3. Ability to present views and concepts clearly through oral communication.

### Group work and people skills

4. Ability to understand group dynamics and work effectively with people from diverse backgrounds;
5. Ability to manage conflict;
6. Ability to organize and delegate tasks.

### Critical thinking and creative and effective problem solving

7. Ability to solve diverse, structured and unstructured problems;
8. Ability to deal effectively with imposed pressures and deadlines.

The basics for most of these skills may be taught in prior bachelor degree programs and are taught in the foundation core courses. Experiences are provided to students throughout the program in a variety of ways to develop these skills. A student's progress is to be documented and evaluated by self evaluation, peer evaluation, and faculty evaluation.

## MASTER'S DEGREE

The College of Business Administration (CBA) offers graduate programs which lead to the degrees of Master of Business Administration, Master of Science in Management, Master of Taxation, and Master of Science in Accountancy. The University has offered programs of study in business since 1919, initially through the Department of Commerce and since 1953 through the College of Business Administration. In 1958, graduate studies in business were begun. Both the under-

graduate and master's programs are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

During its long tradition, the college has sought to fulfill the educational and professional needs of its 1200 graduate students, the community and regional business organizations. To meet its urban objectives, the college offers most graduate courses only between 5:20 p.m. and 10:30 p.m. The master's programs are designed to serve those who work full-time and wish to pursue a master's program on a part-time basis. However, many students enroll full-time to complete the master's program in a shorter period.

## Admission

### Policy

The applicant must meet one (1) of the following eligibility requirements which are in conformity with the Graduate School and the college's accrediting agency (AACSB).

- Hold a domestic baccalaureate degree from a regionally accredited college or university and have a total index score of 1,000 or more points based upon the overall undergraduate grade-point average (GPA)(A=4.0) times 200 plus the Graduate Management Admissions Test (GMAT) score.
- Hold a domestic baccalaureate degree from a regionally accredited college or university and have a total index score of 1,050 or more points based on the junior-senior (i.e., last 64 semester or 96 quarter credits) GPA (A=4.0) times 200 plus the GMAT score.
- Hold a degree from outside the United States and have an academic standing of first or high second class, satisfactory evidence of competence in English (i.e., TOEFL score of 550 or above) and a score of at least 450 on the GMAT.

Even though an applicant is eligible for consideration, an offer of admission is not guaranteed. Since staff, facilities and resources are limited, a determination must be made as to the number of applicants who can be adequately served among those eligible. As a result, offers of admission may be limited to only the most qualified of the eligible applicants as determined by the CBA Graduate Admissions Committee. The committee will consider the following in making decisions: the difficulty of the applicant's undergraduate program; the length of time and activities since graduation; and the percentile ranking on the GMAT.

In rare instances, the applicant who has taken the GMAT but does not meet requirements may be considered for admission. Also, those who have previously been denied admission may, upon presentation of new information, be reconsidered. In either case, the applicant must petition, in writing, the CBA Graduate Admissions Committee giving those reasons relevant to the situation which demonstrate the likelihood of success – the burden of proof is on the applicant.

Under the regulations of the Graduate School, eligible applicants who have been extended an offer of admission by the CBA Graduate Admissions Committee are recommended to the dean of the Graduate School for either "full" or "provisional" graduate status. Those admitted with the classification "provisional status" who have not attained an overall 3.00 GPA upon the completion of 12 graduate credits will be dismissed from the program.

### Procedure

GMAT scores should be sent to the Director of Graduate Programs in Business, College of Business Administration, The University of Akron, Akron OH 44325-4805 (institution code 1829). The GMAT test is administered world-wide and the applicant should register for it sufficiently in advance to the filing of the graduate application, so evaluation for admission will not be delayed. GMAT registration bulletins can be obtained from the Graduate Programs in Business Office or the Educational Testing Service, Box 966-R, Princeton, NJ 08540. Those who have taken the GMAT more than five years ago are normally required to retake it.

All applications and accompanying documentation are evaluated simultaneously by the Graduate Admissions Committee (GAC). The GAC meets monthly and the applicant will be informed in writing of the GAC's decision within one week of the meeting.

### Requirements

To be awarded any master's degree from the College of Business Administration, a student must:

- Meet the time and grade-point requirements of the Graduate School.
- Complete the minimum credits in each of the degree descriptions.
- Complete all course requirements of applicable master's program.

### Transfer Policy

The College of Business Administration will permit nine credits of comparable graduate credits to be transferred into any of the graduate business programs (10 law school credits into the J.D./M.Taxation program). These credits must be pre-approved by the director of graduate programs in the C.B.A. This nine credit policy also applies to second degree applicants.

## Second Degree

For a student who has already obtained one master's degree in business, it is possible to pursue another degree in the college provided that: (1) no second M.B.A. is to be obtained; (2) the degree sought is not in the same functional discipline; (3) the desired program (degree curriculum) is specifically approved in advance by the director of graduate programs in business; and (4) not fewer than 21 new credits are earned for the second degree.

3400:575	Mexico	3
3700:505	Politics in the Middle East	3
3700:511	Theories of International Political Economy	3
3700:512	Global Environment Politics	3
3700:525	Latin American Politics	3
3870:561	Language and Culture	3

or any cross-cultural or cross-functional course approved by the Graduate MBA Director.

## Master of Business Administration

The Master of Business Administration program is designed to give the student a general knowledge of the functional areas of business and permit the concentration of study in one of the five following areas: accounting, finance, management, marketing or international business. The program consists of 58 graduate credits. Foundation courses may be waived for those who have had recent study in the areas. Foundation and advanced courses can be taken concurrently provided that all prerequisites have been met.

• Foundation Courses		
All are required unless waived at the time of admission:		
3250:600	Foundation of Economic Analysis	3
6200:601	Financial Accounting	3
6400:602	Managerial Finance	3
6400:655	Government and Business	3
6500:600	Management and Organizational Behavior	3
6500:601	Quantitative Decision Making	3
6500:602	Computer Techniques for Management	3
6600:600	Marketing Concepts	3
• Functional Core (12 credits):		
6200:610	Accounting Management and Control	3
6400:674	Financial Management and Policy	3
6500:670	Operations Management	3
6600:620	Strategic Marketing Management	3
• Professional Core (4 credits):		
6700:690	Professional Responsibility	1
6700:692	International Business	1
6700:694	Applied Business Documentation and Contact	1
6700:696	Special Topics in Professional Development	1
• Quantitative Tools (3 credits):		
Student must complete one of the following courses:		
6200:664	Research and Quantitative Methods in Accounting	3
6400:650	Administering Costs and Prices	3
6500:662	Applied Operations Research	3
6600:640	Business Research Methods	3
• Concentration (9 credits):		
The student must select 9 credits in a field of concentration (accounting, finance, management, marketing, international business, quality management, materials management, health services administration).		
• Free Electives (3 credits)		
Student must select 3 credits of free electives outside area of concentration. Approval of Director is required.		
• Integrative (3 credits)		
6500:695	Business Strategy and Policy; Domestic and International (restricted to students graduating within two semesters)	3
• Program Summary		
	Foundation Core	24
	Functional Core	12
	Professional Core	4
	Quantitative Tools	3
	Concentration	9
	Free Elective	3
	Integrative	3
	Total Program	58

If the Foundation Core Courses are all waived, the program is 34 credits in length.

Note: International Business concentration students must select one of the following options.

- Foreign Language option: demonstrate reading and conversational proficiency in a language other than English.
- Cross-Cultural option: select one course (3 credits) from the following courses.

3250:550	Comparative Economic Systems	3
3250:560	Economic Development and Planning for Underdeveloped Countries	3
3250:670	International Monetary Economics	3
3250:671	International Trade	3
3350:538	World Metropolitan Areas	3
3350:550	Development Planning	3
3350:633	Comparative Planning	3
3400:516	Modern India	3
3400:573	Latin America: The Twentieth Century	3

## Master of Science in Accountancy

The Master of Science in Accountancy program is designed to provide students with undergraduate degrees in areas other than accounting with a professional accounting program which will enable the student to pass the CPA Examination and pursue career options which combine their undergraduate interests with professional accounting credentials. Graduates of this program will be eligible to sit for the Uniform CPA Examination under the Ohio 150-hour Legislation.

• Foundation Courses*:		
6600:600	Marketing Concepts	3
6400:602	Managerial Finance	3
6500:600	Management and Organizational Behavior	3
6200:601	Financial Accounting	3
6200:603	Business Systems with Processing Applications	3
6500:601	Quantitative Decision Making	3
6400:623	Legal Aspects of Business Transactions	3
3250:600	Foundations of Economic Analysis	3
The advanced program consists of 36 hours of which 27 are required and 9 are elective. For a student entering with no business background, the total program, with foundation coursework, is 60 hours.		
• Advanced Courses:		
<i>Required</i>		
6200:621	Corporate Accounting and Financial Reporting I	3
6200:622	Corporate Accounting and Financial Reporting II	3
6200:610	Accounting, Management and Control	3
6200:655	Advanced Information Systems	3
6200:530	Taxation I	3
6200:531	Taxation II	3
6200:540	Auditing	3
3300:675	Writing for MBAs	3
<i>Electives</i>		
	One 600-level accounting elective	3
	Two 500- or 600-level (non-accounting) electives	6

\*Foundation courses will be waived for students with recent study in the subject areas.

## Master of Taxation

The Master of Taxation Program is a professional degree designed to provide intensive training both for those planning to enter the field and for experienced accountants and attorneys.

The program provides a framework of conceptual, technical and professional knowledge which will assist the student in developing the expertise needed to examine and understand many aspects of the difficult tax structure. Through an integrated curriculum with emphasis on tax concepts, substantive knowledge of federal and state taxation, tax research and communication skills and tax planning, the student develops an ability to identify and solve tax problems.

The Master of Taxation curriculum consists of a set of foundation courses and a set of required taxation courses. A minimum of 30 semester credits is required for the degree. Foundation courses may be waived for those who have had recent study in the subject areas.

• Foundation Courses:		
6200:601	Financial Accounting	3 credits
6200:621	Corporate Accounting and Financial Reporting I	3 credits
6200:622	Corporate Accounting and Financial Reporting II	3 credits
6200:623	Legal Aspects of Business Transactions	3 credits
6200:530	Taxation I	3 credits
6200:531	Taxation II	3 credits
• Required Master of Taxation Courses:		
6200:628	Basic Tax Research	1 credit
6200:631	Corporate Taxation I	3 credits
6200:632	Taxation of Transactions in Property	3 credits
6200:633	Estate and Gift Taxation	3 credits
• Electives:		
Twenty credits of graduate taxation courses selected from courses numbered 6200:641-693.		
Total Required Taxation Courses		30-48 credits

In exceptional situations, subject to the approval of the Chair of the G.W. Daverio School of Accountancy, up to six credits of approved graduate College of Business Administration courses may be allowed as electives.

## Master of Science in Management

The Master of Science in Management program allows students to concentrate their advanced study in one of two areas: human resource management or information systems management. Because of the complex nature of these specializations, they are not normally offered as options in traditional MBA programs. They are designed for individuals who know what they want to do or to help them apply what they already know more effectively. For example, computer science majors may choose to concentrate in information systems while psychology majors would benefit from the human resource management option. The introductory coursework for this program is termed a foundation core and consists of 24 credits which may be waived if the student has completed prior study in the area. The remaining 30 credits of coursework consists of 12 credits of general management coursework, 15 credits of specialization courses and one 3-credit free elective. If all foundation courses are waived, the program is 30 credits in length.

### • Foundation Core:

All are required unless waived at time of admission:

3250:600	Foundation of Economic Analysis	3
6200:601	Financial Accounting	3
6400:602	Managerial Finance	3
6400:655	Government and Business	3
6500:600	Management and Organizational Behavior	3
6500:601	Quantitative Decision Making	3
6500:602	Computer Techniques for Management	3
6600:600	Marketing Concepts	3

### • MSM Core Courses:

6500:640	Management Information Systems	3
6500:663	Data Analysis for Managers	3

Organizational Core Courses: Choose 1

6500:653	Organizational Theory	3
6500:652	Organizational Behavior	3

Operations Core Courses: Choose 1

6500:662	Applied Operations Research	3
6500:670	Operations Management	3

### • Free Elective:

Any 3 graduate credits approved by the Graduate Director	3
<b>Total Core:</b>	<b>15</b>

### Options:

Choose a concentration from the following:

#### Information Systems Management (ISM) 15 credits

##### • ISM Required Concentration Courses:

6500:641	Data Management and Communication	3
6500:643	Analysis and Design of Business Systems	3
6500:644	Managerial Decision Support and Expert Systems	3
6500:645	Advanced Management Information Systems	3

##### • ISM Restricted Electives (Select 3 credits):

6500:642	Systems Simulation	3
6500:678	Project Management	3
6500:651	Productivity and Quality of Worklife Issues	3
6700:696	Selected Topics in Professional Development with approval of the Graduate Director	1
or 3 graduate credits approved by the Director		3

#### Human Resource Management (HRM) (15 credits)

##### • HRM Required Concentration Courses:

6500:650	Fundamentals of Human Resource Administration	3
6500:654	Labor Management Relations	3
6500:655	Compensation Administration	3
6500:652	Organizational Behavior	3
or		
6500:653	Organizational Theory	3

##### • HRM Restricted Electives (Select 3 credits):

6500:658	Strategic Human Resource Management	3
6500:660	Employment Regulation	3
6500:651	Productivity and Quality of Worklife Issues	3
6700:696	Selected Topics in Professional Development with approval of the Graduate Director	1
or 3 graduate credits approved by the Director		3

<b>Total concentration:</b>	<b>15</b>
<b>Total program</b>	<b>30*</b>

\*54 total credits if foundation courses are required; see Graduate Director.

### Health Services Administration

The Department of Management has made the Master of Science in Management–Health Services program inactive. No students will be admitted to this program until further notice.

### Materials Management

The Department of Management has made the Master of Science in Management–Materials Management program inactive. No students will be admitted to this program until further notice.

### Quality Management

The Department of Management has made the Master of Science in Management–Quality Management program inactive. No students will be admitted to this program until further notice.

## Joint Programs

The School of Law and the College of Business Administration (CBA) offer a joint program in legal and administrative studies (J.D./M.B.A.) and a joint program in legal and taxation studies (J.D./M.Tax.). These combinations are open to the student preparing for a career in such areas as corporate law, tax accounting or legal practice in government. The amount of time required to complete a joint degree program is shorter than the time required to complete both programs independently. To pursue either cooperative program, the student must apply to and be accepted by both the School of Law and the Graduate School of the CBA. The student should contact each school independently for information covering admission criteria and procedures (for further information on School of Law admissions, write: Director of Admissions, School of Law, The University of Akron, Akron, OH 44325-2901). A baccalaureate degree is required.

## Degree Requirements

A student is required to fulfill the requirements of the School of Law, 87 credits, which includes 10 credits transferred from the CBA. The requirements of the CBA may be met by fulfilling the requirements previously listed which include the common body of knowledge (Foundation) courses (unless waived because of prior undergraduate credits earned) and 25 credits for M.B.A. of advanced courses in the CBA plus six credits transferred from the School of Law. The Master of Taxation program consists of 20-24 credits of advanced courses in the CBA plus 10 credits transferred from the School of Law. The reciprocal acceptance of course credits by each school is the essence of the joint programs. All law courses used to fulfill CBA requirements must be approved by the director of Graduate Programs in Business prior to completion. To earn both degrees, a total of 97 (J.D./M.Tax.) or 102 (J.D./M.B.A.) credits is required, depending on the master's program pursued. More credits may be required for the master's degree if Foundation courses are required.

Upon the approval of the director of Graduate Programs in Business, 10 credits of School of Law courses may be applied toward the Masters of Taxation degree. No more than six credits from the School of Law may be in non-tax courses. The other four credits taken in the School of Law must be in tax courses which substitute for equivalent tax courses in the CBA.

J.D./M.B.A. students may transfer nine credits of School of Law courses into the M.B.A. program. Six credits must be in their area of concentration and must be selected from the courses listed below. Related courses not listed under concentrations may transfer with approval of the director of graduate programs in Business Administration. Three credits of free electives may be chosen from other business-related law courses and must be approved by the director of graduate programs in Business Administration.

### Law Courses to be used as MBA Concentration Courses

Choices for Concentration Electives:

Accounting (choose 6 credits)

9200:639	Estate and Gift Taxation
9200:640	Individual Taxation
9200:641/642	Corporate Taxation I, II
9200:665	Taxation of Partnerships and S Corporations
9200:674	Current Problems in Taxation
9200:675	Special Problems in Estate Planning
9200:680	Qualified Pensions and Profit Sharing
9200:685/686	Wills, Trusts and Estates I, II

Finance (choose 6 credits)

9200:629	Commercial Law II
9200:635	Bankruptcy Law
9200:639	Estate and Gift Taxation
9200:652	Land Use Planning
9200:671	Securities Regulation
9200:675	Special Problems in Estate Planning
9200:680	Qualified Pensions and Profit Sharing
9200:685/686	Wills, Trusts and Estates I, II
9200:691	International Investments

## International Business (choose 6 credits)

- 9200:649 International Law
- 9200:676 International Trade
- 9200:691 International Investments and the European Economic Community

## Management (choose 6 credits)

- 9200:637 Equal Opportunity Law
- 9200:650 Labor and Employment Law
- 9200:651 Labor Arbitration and Collective Bargaining
- 9200:659 Lawyer as Negotiator
- 9200:660 Workers' Compensation
- 9200:672 Seminar in Business Planning
- 9200:679 Labor Law

## Marketing (choose 6 credits)

- 9200:627 Commercial Law I
- 9200:659 Lawyer as Negotiator
- 9200:662 Media Law
- 9200:667 Patent, Trademark and Copyright Law
- 9200:672 Seminar in Business Planning
- 9200:683 Seminar in Product Liability
- 9200:684 Sports and Entertainment Law

# College of Fine and Applied Arts

Linda Moore, Ph.D., *Dean*

John D. Bee, Ph.D., *Interim Associate Dean*

William H. Seaton, Ph.D., *Associate Dean*

## Mission Statement

The College of Fine and Applied Arts is dedicated to enhancing the quality of life of the individual, the University, and the community. Through instruction, research, creative activity, and outreach programs, the College fosters artistic and social inquiry and direct application of knowledge to self, family and society. Students are supported in their quest for knowledge of their chosen fields and encouraged to shape their artistic and social environments.

## MASTER'S DEGREE

### Home Economics and Family Ecology

The program of study is offered leading to the Master of Arts in Home Economics and Family Ecology degree offers options in child development; child life; clothing, textiles and interiors; family development; and food science. Students must meet the following admission requirements for acceptance in the program:

- Minimum GPA of 2.75 for four years of undergraduate study or 3.00 for the last two years of undergraduate study.
- Completion of general Graduate Record Examination within the five years preceding application, with a minimum total score of 1200 on the three parts of the GRE.
- Submission of a letter of personal career goals, sent to the director of graduate studies.

Two letters of recommendation may be submitted, if desired.

The graduate faculty of the School of Home Economics and Family Ecology may require an interview with any applicant.

Accepted students will be expected to comply with the following requirements:

- Complete the course of study in one of the five options, with a minimum of 40 credits.

These credits will include:

- foundation courses to prepare for research in home economics and family ecology as an interdisciplinary field;
- core courses in the area of specialty;
- option electives and cognate electives, selected in consultation with academic adviser, from within School or in another discipline. These are chosen to strengthen student's professional goals.
- Pass a written comprehensive examination over major and minor areas after the completion of at least 24 credits of graduate work.
- Complete a master's thesis or a master's project. The thesis option involves the design and evaluation of original research in an appropriately related area commensurate with the student's background and area of pursuit. The project option involves the design, development, implementation, and evaluation of original and creative programs and/or resource materials. A written proposal for the thesis or project cannot be submitted until successful completion of the comprehensive examination.
- Apply for advancement to candidacy upon successful completion of 24 credits of graduate study, the written comprehensive examination, and an approved prospectus or proposal for a thesis or project.
- Pass an oral examination covering the thesis or project report.

### Foundation Courses

- Required by all program options:

7400:604	Orientation to Graduate Studies in Home Economics and Family Ecology	1
7400:680	Historical and Conceptual Bases of Home Economics and Family Ecology	3
7400:685	Research Methods in Home Economics and Family Ecology	3

### Child Development Option

- Core Courses:

7400:605	Developmental Parent-Child Interactions	3
7400:610	Child Development Theories	3
7400:665	Development in Infancy and Early Childhood	3

- Option Electives

Select 12 credits from the following courses with approval of adviser (if a course has been taken at the undergraduate level, other courses must be selected):

7400:501	Family-Life Patterns in the Economically Deprived Home	2
7400:504	Adolescence in the Family Context	3
7400:542	Human Sexuality	3
7400:545	Public Policy and American Families	3
7400:548	Before and After School Child Care	2
7400:560	Organization and Supervision of Child-Care Centers	3
7400:596	Parent Education	3
7400:607	Family Dynamics	3
7400:616	Infant and Child Nutrition	3
7400:651	Family and Consumer Law	3
7400:660	Programming for Child-Care Centers	3
7400:688	Practicum in Home Economics and Family Ecology	3

- Cognate Electives

Select 7 credits with approval of adviser from within the School of Home Economics and Family Ecology OR from a cognate area outside the School, OR from a combination of the two.

- Thesis or Project (select one):

7400:694	Master's Project	5
7400:699	Master's Thesis	5
	Total	40

### Child Life Option

- Core Courses:

7400:551	Child in the Hospital	4
7400:555	Practicum: Establishing and Supervising a Child Life Program	3
7400:585	Orientation to the Hospital Setting	2
7400:695	Child Life Internship	5

- Option Electives:

Select 10 credits with approval of adviser from among the following (if a course has been taken at the undergraduate level, other courses must be selected):

7400:501	Family-Life Patterns in the Economically Deprived Home	2
7400:504	Adolescence in the Family Context	3
7400:542	Human Sexuality	3
7400:560	Organization and Supervision of Child-Care Centers	3
7400:585	Seminar in Home Economics (Child Life topic)	3
7400:596	Parent Education	3
7400:605	Developmental Parent-Child Interactions	3
7400:610	Child Development Theories	3
7400:616	Infant and Child Nutrition	2
7400:660	Programming for Child-Care Centers	2
7400:665	Development in Infancy and Early Childhood	3

- Cognate Electives:

Select 6 credits with approval of adviser from within the School of Home Economics and Family Ecology OR from a cognate area outside the School OR from a combination of the two.

- Thesis or Project (select one):

7400:694	Master's Project	5
7400:699	Master's Thesis	5
	Total	42

### Clothing, Textiles and Interiors Option

- Core Courses:

7400:634	Material Culture Studies	3
7400:639	Theories of Fashion	3
7400:677	Social Psychology of Dress and the Near Environment	3

- Options Electives:

7400:518	History of Interior Design I	4
7400:519	History of Interior Design II	4
7400:523	Professional Image Analysis	3
7400:525	Advanced Textiles	3
7400:527	Textile and Apparel Industry	3
7400:533	Residential Design	3
7400:535	Principles and Practices Interior Design	3
7400:536	Textile Conservation	3
7400:537	Historic Costume to 1800	3
7400:538	History of Fashion Since 1780	3
7400:631	Problems in Design	1-6
7400:688	Practicum in Home Economics and Family Ecology	3
7400:696	Individual Investigation in Home Economics and Family Ecology	1-6

• Cognate Electives:

Select 6 credits with approval of adviser from courses within the School of Home Economics and Family Ecology OR from a cognate area outside the School OR from a combination of the two.

• Thesis or Project (select one):

7400:694	Master's Project	5
7400:699	Master's Thesis	5
	Total	40

**Family Development Option**

• Core Courses:

7400:602	Family in Life-Span Perspective	3
7400:607	Family Dynamics	3
7400:651	Family and Consumer Law	3

• Option Electives

Select 12 credits from the following courses with approval of adviser (if a course has been taken at the undergraduate level, other courses must be selected):

7400:501	Family-Life Patterns in the Economically Deprived Home	2
7400:504	Adolescence in the Family Context	3
7400:506	Family Financial Management	3
7400:540	Family Crisis	3
7400:542	Human Sexuality	3
7400:545	Public Policy and American Families	3
7400:546	Culture, Ethnicity and the Family	3
7400:596	Parent Education	3
7400:601	Families in Transition	2
7400:603	Family Relationships in Middle and Later Years	3
7400:605	Developmental Parent-Child Interactions	3
7400:610	Child Development Theories	3
7400:688	Practicum in Home Economics and Family Ecology	3

• Cognate Electives:

Select 7 credits with the approval of adviser from within the School of Home Economics and Family Ecology OR from a cognate area outside the School OR a combination of the two.

• Thesis or Project (select one):

7400:694	Master's Project	5
7400:699	Master's Thesis	5
	Total	40

**Food Science Option**

• Core Courses:

7400:575	Analysis of Food	3
7400:576	Developments in Food Science	3
7400:520	Experimental Foods (if taken at the undergraduate level, choose 3 additional credits from option electives)	3

• Option Electives:

Select 9-12 credit hours with the approval of adviser from among the following (if a course has been taken at the undergraduate level, other courses must be selected):

3100:500	Food Plants	2
3250:540	Special Topics: Economics/World Food Problems	4
7400:574	Cultural Dimensions of Food	3
7400:585	Seminar in Home Economics and Family Ecology (Food Science topic)	2-3
7400:570	The Food Industry: Analysis and Field Study	3
7400:503	Advanced Food Preparation	3
7400:524	Nutrition in the Life Cycle	3
7400:624	Advanced Human Nutrition I	3
7400:625	Advanced Human Nutrition II	3
7400:688	Practicum in Home Economics and Family Ecology	3

• Cognate Electives:

Select 5-8 credits with approval of adviser from the School of Home Economics and Family Ecology OR from a cognate area outside the School OR from a combination of the two.

• Thesis or Project (select one):

7400:694	Master's Project	5
7400:699	Master's Thesis	5
	Total	40

**Note:** Students in all of the options who are working on a master's thesis may elect to take the course 7400:690 Thesis Research/Reading. This course will not, however, count as part of the required 40-42 credits in the program.

**Nutrition and Dietetics**

A program of study is offered leading to the Master of Science in Nutrition and Dietetics. Students must meet the following admission requirements for acceptance in the program:

- Meet the minimum GPA of 2.75 for four years of undergraduate study or 3.00 for the last two years of undergraduate study.
- Have completed the general Graduate Record Examination within the five years preceding the application and achieved a minimum total score of 1200 on the three parts of the GRE.
- Submit a letter of personal career goals.
- Offer two letters of recommendation if desired.

The graduate faculty of the School of Home Economics and Family Ecology may require an interview with any applicant.

In addition to the above, the student will be expected to comply with the following requirements:

- Complete the course of study with a minimum of 40 credits. These credits will include:
  - foundation courses to prepare the student for research in home economics and family ecology as a discipline;
  - core courses in the area of specialty;
  - electives selected from within the department or from another discipline to strengthen student's professional goals. These courses will be selected in consultation with and approval from the student's graduate faculty adviser.
- Pass a written comprehensive examination over major and minor areas after the completion of at least 24 credits of graduate work.
- Apply for advancement to candidacy upon successful completion of 25 credits of graduate study, the written comprehensive examination, and an approved prospectus for a thesis or project.
- Complete a thesis or a project. The thesis option involves the design and evaluation of original research in an appropriately related area commensurate with the student's background and area of pursuit. The project option involves the design, development, implementation and evaluation of original and creative programs and/or resource materials. A written proposal for the thesis or project cannot be submitted until the successful completion of a comprehensive examination.
- Pass an oral examination covering the thesis or project.

**Foundation Courses**

• Required by all program options:

7400:604	Orientation to Graduate Studies in Home Economics and Family Ecology	1
7400:680	Historical and Conceptual Bases of Home Economics and Family Ecology	3
7400:685	Research Methods in Home Economics and Family Ecology	3

• Core Courses:

7400:624	Advanced Human Nutrition I	3
7400:625	Advanced Human Nutrition II	3

**Electives** (9 to 12 credits required)

Select with the approval of adviser from among the following. At least 2 courses must be selected from Biology (3100) or Chemistry (3150). If a nutrition course has been taken at the undergraduate level, it may not be used at the graduate level.

3100:561	Human Physiology I	4
3100:562	Human Physiology II	4
3100:565	Cardiac Physiology	3
3100:584	Pharmacology	3
3100:670	Medical Physiology, Pathophysiology, and Pharmacology	3
3100:686	Research in the Biology of Aging	3
3150:501	Biochemistry Lecture I	3
3150:502	Biochemistry Lecture II	3
7400:520	Experimental Foods	3
7400:524	Nutrition in the Life Cycle	3
7400:574	Cultural Dimensions of Foods	3
7400:576	Developments in Food Science	3
7400:580	Community Nutrition I - Lecture	3
7400:582	Community Nutrition II - Lecture	3
7400:587	Sports Nutrition	3
7400:588	Practicum in Dietetics	1-3
7400:589	Professional Preparation for Dietetics	1
7400:640	Nutrition in Diminished Health	3

**Cognate Electives** (8 to 11 credits required)

Select with the approval of adviser from among the following or other courses that strengthen the student's goals.

3470:664	Statistics for the Health Sciences	4
3850:678	Social Gerontology	3
5600:651	Techniques of Counseling	3
6500:600	Management and Organizational Behavior	3
6500:602	Computer Techniques for Management	3

**Note:** The M.S. in Nutrition and Dietetics is not a route to becoming a Registered Dietitian (R.D.). Students interested in becoming R.D.s should contact the School for proper course selection, some of which can be done at the graduate level.

## Music

The degree Master of Music is offered by the School of Music with options in music education, performance, composition, theory, music history and literature, and accompanying. Entrance requirements for each program are as follows:

- The standard requirements for an undergraduate major in the area of proposed graduate specialty or performance which the school director approves as equivalent to an undergraduate major.
- The Graduate School's requirements for admission.
- The performance and accompanying options require an audition on the student's major instrument/voice. Please contact the coordinator of Graduate Studies for an audition time.
- For the composition option, compositions representing the applicant's techniques are required.
- The options in music education, music theory, and music history and literature require an interview with faculty in the appropriate area.

The student should consult with the coordinator of Graduate Studies in Music for additional information regarding the individualized nature of each option.

For the performance option in voice, a proficiency equal to two semesters each of Italian, German and French are required for completion of the Master of Music Degree in Voice Performance. If the student lacks background in any of these languages, auditing of undergraduate courses is required.

After completion of all course work, the student must pass an examination covering the graduate program. This examination is individualized for each candidate's unique program.

## Composition Option

- Music core courses – eight credits (to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:556	Advanced Conducting: Choral	2
7500:615	Musical Styles and Analysis I (Chant through Palestrina)	2
7500:616	Musical Styles and Analysis II (Baroque through early Beethoven)	2
7500:617	Musical Styles and Analysis III (Late Beethoven through Mahler/Strauss)	2
7500:619	Theory and Pedagogy	2

- Major required courses – 21-23 credits:

7500:601	Choral Literature	2
7500:618	Musical Styles and Analysis IV (20th Century)	2
7500:624	Music History Survey: 20th Century	2
7500:647	Master's Chamber Recital	1
7500:699	Master's Thesis	4-6
7510:6—	Ensemble (participation in two ensembles required)	2
7520:642	Applied Composition	8

- Additional music courses – zero to two credits.

Graduate-level (music) courses, workshops, applied lessons (other than in composition) and/or advanced problems to be selected by the student and adviser.

- Electives – three credits.

To be selected by student and adviser, Areas include graduate-level courses in other disciplines, such as theatre arts, in which the student obtains permission of instructor, or 7520:642 *Applied Composition*.

Degree total: 34-36 credits.

## Music Education Option

### Thesis Option – 32 credits

- Required Music Education Core Courses – 13-15 credits

7500:611	Foundations of Music Education	3
7500:612	Practices and Trends in Music Education	3
7500:614	Measurement and Evaluation in Music Education	3
7500:699	Master's Thesis	4-6

- Additional music/education courses – select 17-19 credits with approval music education and graduate advisers

7500:675	Seminar in Music Education	1-3
7500:697	Advanced Problems in Music Education	2-8
Topics may include: General Music; Kodaly Principles & Techniques; Children's Choirs; Psychology of Music; Self-Esteem in Music; Music Learning; Arranging; Choral Literature; Choral Methods; Instrumental Methods and Techniques; and Conducting.		

7500:590	Music Workshops	2-6
7520:5—/6—	Applied Music	2-6
7510:6—	Ensemble	1-2
7500:615/618	Musical Styles and Analysis	2-4
7500:621/624	Music History Survey	2-4
5100:6—/7—	Educational Foundations	2-4
5200:6—/7—	Elementary Education	
5300:6—/7—	Secondary Education	

### Non-Thesis Option – 34 credits

- Required Music Education Core Courses – 9 credits

7500:611	Foundations of Music Education	3
7500:612	Practices and Trends in Music Education	3
7500:614	Measurement and Evaluation in Music Education	3

- Additional music/education courses – select 25 credits with approval of music education and graduate advisers

7500:675	Seminar in Music Education	1-3
7500:697	Advanced Problems in Music Education	2-8

Topics may include: general music; Kodaly Principles & Techniques; Children's Choirs; Psychology of Music; Self-Esteem in Music; Music Learning; Arranging; Choral Literature; Choral Methods; Instrumental Methods and Techniques; and Conducting.

7500:590	Music Workshops	2-6
7520:5—/6—	Applied Music	2-6
7510:6—	Ensemble	1-2
7500:615/618	Musical Styles and Analysis	2-4
7500:621/624	Music History Survey	2-4
5100:6—/7—	Educational Foundations	2-4
5200:6—/7—	Elementary Education	
5300:6—/700	Secondary Education	

## Music History and Literature Option

- Music core courses – eight credits (to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:556	Advanced Conducting: Choral	2
7500:618	Musical Styles and Analysis IV (20th Century)	2
7510:6—	Ensemble (participation required in two ensembles)	2
7500:697	Advanced Problems in Music	4

- Major required courses – 20-22 credits:

7500:551	Introduction to Musicology	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2
7500:625	Graduate Bibliography and Research in Music	2
7500:697	Advanced Problems in Music	4
7500:699	Master's Thesis	4-6

- Additional music courses – two to four credits.

- Graduate-level (music) workshops, applied music and/or courses to be selected by the student and adviser.

- A minimum reading proficiency in German is required. If a student lacks background in this language, completion of undergraduate courses is required.

- Electives – two to four credits.

To be selected by the student and adviser. Areas include graduate-level courses in other disciplines in which student obtains permission of instructor.

Degree Total: 34-36 credits.

## Music Technology Option

The Master of Music, Music Technology Option is designed to give the student additional exposure to the functional areas of music plus an advanced concentration in music technology and related business. The program provides a framework of conceptual, technical and professional knowledge which will assist the student in career opportunities of fields related to music technology. Students will leave the program with a portfolio of tutorials, recorded works, and/or computer software.

- Music core courses – six credits (to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:556	Advanced Conducting: Choral	2
7500:615	Musical Styles and Analysis I	2
7500:616	Musical Styles and Analysis II	2
7500:617	Musical Styles and Analysis III	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2

- Major required courses – 26-28 credits:

7500:625	Graduate Bibliography and Research in Music	2
7500:553	Music Software Survey and Use	2
7500:613	Instructional Programming in Music for the Microcomputer	3
7500:618	Musical Styles and Analysis IV (20th century)	2

7500:619	Theory and Pedagogy	2
7500:697	Advanced Problems in Music	4
7500:699	Master's Thesis	4-6
7510:6__	Ensemble (participation in two ensembles sequences)	2
7500:626	Music Typography	3
7500:627	Computer Studio Design	2

• Electives – 0-2 credits.

To be selected by the student and adviser.

Degree Total: 32-36 credits.

**Performance Option in Accompanying**

• Music core courses – Eight credits (to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:566	Advanced Conducting: Choral	2
7500:615	Musical Styles and Analysis I (Chant through Palestrina)	2
7500:616	Musical Styles and Analysis II (Baroque through early Beethoven)	2
7500:617	Musical Styles and Analysis III (Late Beethoven through Mahler/Strauss)	2
7500:618	Musical Styles and Analysis IV (20th Century)	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2

• Major required courses – 23-26 credits:

Select either 7500:562 or 7500:633

7500:562	Repertoire and Pedagogy: Organ	3
	or	
7500:633	Teaching and Literature: Piano and Harpsichord	2
7500:640	Advanced Accompanying I	1
7500:641	Advanced Accompanying II	1
7500:642	Advanced Accompanying III	1
7500:643	Advanced Accompanying IV	1
7500:666	Advanced Song Literature	3
7500:698	Graduate Recital (to be completed in a minimum of two performance media)	2
7510:614	Keyboard Ensemble (participation in two ensembles required)**	2-4
7510:618	Small Ensemble - Mixed	2
7520:6__	Applied Music (piano, organ and/or harpsichord)	8

• Additional music courses – two to three credits.

Graduate-level (music) courses, advanced problems, workshops and/or applied lessons, to be selected by the student and adviser.

• Elective – two credits.

Areas may include graduate-level courses in other disciplines, such as theatre arts, for which the student obtains permission of instructor, or additional music courses, as determined by the student and adviser.

Degree total: 33-36 credits

Note: A minimum pronunciation proficiency is required in Italian, German and French. If the student lacks background in any of these language requirements, completion of undergraduate courses is required.

All candidates for this degree must accompany a minimum of three solo ensemble recitals (instrumental and vocal). These can be done as part of 7500:697

\*\*Two semesters ensemble participation required for degrees completed in two semesters. Four semesters ensemble participation required for degrees completed in four semesters.

**Performance Option in Winds, String Percussion**

• Music core courses: eight credits to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:566	Advanced Conducting: Choral	2
7500:615	Musical Styles and Analysis I (Chant through Palestrina)	2
7500:616	Musical Styles and Analysis II (Baroque through early Beethoven)	2
7500:617	Musical Styles and Analysis III (Late Beethoven through Mahler/Strauss)	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2

• Major required courses – 16-18 credits:

7500:618	Musical Styles and Analysis IV (20th Century)–	2
7510:6__	Ensemble (participation in two ensembles required)**	2-4
7520:6__	Applied Music (select appropriate instrument)	8

• Select one of the following as appropriate to major instrument:

7500:630	Teaching and Literature: Brass Instruments	2
7500:631	Teaching and Literature: Woodwind Instruments	2
7500:632	Teaching and Literature: Percussion Instruments	2
7500:634	Teaching and Literature: String Instruments	2
7500:698	Graduate Recital	2

• Additional music courses – six credits. \*

Graduate-level (music) workshops, applied lessons, advanced problems and/or courses to be selected by student and adviser.

• Electives – four credits. \*

Areas may include graduate-level courses in other disciplines, such as theatre arts, in which the student obtains permission of instructor, or additional music courses, as determined by the student and adviser.

Degree total: 34-36 credits.

Note: No more than a total of 16 credits of 7520 courses may be applied to the degree.

**Performance Option in Voice**

• Music core courses: eight credits (to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:566	Advanced Conducting: Choral	2
7500:615	Musical Styles and Analysis I (Chant through Palestrina)	2
7500:616	Musical Styles and Analysis II (Baroque through early Beethoven)	2
7500:617	Musical Styles and Analysis III (Late Beethoven through Mahler/Strauss)	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2

• Major required courses – 20-22 credits:

7500:618	Musical Styles and Analysis IV (20th Century)	2
7500:665	Vocal Pedagogy	3
7500:666	Advanced Song Literature	3
7500:698	Graduate Recital	2
7510:6__	Ensemble (participation in two ensembles required)**	2-4
7520:624	Applied Voice	8

• Additional music courses – two credits (suggested minimum).

Graduate-level (music) courses, workshops, advanced problems and/or applied lessons, to be selected by student and adviser.

• Electives – four credits.

Areas may include graduate-level courses in other disciplines, such as theatre arts, in which the student obtains permission of instructor, or additional music courses, as determined by the student and adviser.

Degree total: 34-36 credits.

**Performance Option in Keyboard**

• Music core courses: eight credits (to be selected):

7500:555	Advanced Conducting: Instrumental	2
7500:566	Advanced Conducting: Choral	2
7500:615	Musical Styles and Analysis I (Chant through Palestrina)	2
7500:616	Musical Styles and Analysis II (Baroque through early Beethoven)	2
7500:617	Musical Styles and Analysis III (Late Beethoven through Mahler/Strauss)	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2

• Major required courses – 18-21 credits:

7500:618	Musical Styles and Analysis IV (20th Century) (Select either 7500:562 or 7500:633)	2
7500:562	Repertoire and Pedagogy: Organ	2
	or	
7500:633	Teaching and Literature: Piano and Harpsichord	2
7500:697	Advanced Problems in Music	2
7500:698	Graduate Recital	2
7510:614	Keyboard Ensemble (participation in two ensembles required)**	2-4
7520:6__	Applied Music (piano, organ and/or harpsichord)	8

• Additional music courses – three to four credits.

Graduate-level (music) courses, advanced problems, workshops and/or applied lessons, to be selected by the student and adviser.

• Electives – four credits.

Areas may include graduate level courses in other disciplines, such as theatre arts, for which the student obtains permission of instructor, or additional music courses, as determined by the student and adviser.

Degree total: 34-36 credits.

\*It is recommended that each student's graduate committee recommend the appropriate elective credits.

\*\*Two semesters ensemble participation required for degrees completed in two semesters. Four semesters ensemble participation required for degrees completed in four semesters.

## Theory Option

- Music core courses – six credits (to be selected):

7500:553	Bibliography and Research	2
7500:555	Advanced Conducting: Instrumental	2
7500:556	Advanced Conducting: Choral	2
7500:621	Music History Survey: Middle Ages and Renaissance	2
7500:622	Music History Survey: Baroque	2
7500:623	Music History Survey: Classic and Romantic	2
7500:624	Music History Survey: 20th Century	2

- Major required courses – 26-28 credits:

7500:615	Musical Styles and Analysis I (Chant through Palestrina)	2
7500:616	Musical Styles and Analysis II (Baroque through early Beethoven)	2
7500:617	Musical Styles and Analysis III (Late Beethoven through Mahler/Strauss)	2
7500:618	Musical Styles and Analysis IV (20th Century)	2
7500:619	Theory and Pedagogy	2
7500:697	Advanced Problems in Music	8
7500:699	Master's Thesis	4-6
7510:6—	Ensemble (participation in two ensembles required)**	2
7520:642	Applied Composition	2

- Additional music courses – zero to two credits.

Graduate-level (music) workshops, applied music (other than composition), advanced problems, and/or courses to be selected by student and adviser.

- Electives – zero to two credits.

To be selected by student and adviser. Areas include graduate-level courses in other disciplines in which student obtains permission of instructor or 7520:642 Applied Composition.

Degree total: 34-36 credits.

\*\*Two semesters ensemble participation required for degrees completed in two semesters. Four semesters ensemble participation required for degrees completed in four semesters.

## Communication

The School of Communication offers the master of arts degree in a coordinated program of communication arts.

Entrance requirements:

- Meet the general requirements for admission to the Graduate School.
- Possess an undergraduate major in communication, journalism or a related field; or, complete at least 15 semester credits of undergraduate communication coursework approved by the department.

### Program requirements:

- Complete 36 credits, distributed as follows:

School core courses – 12 credits:

7600:600	Introduction to Graduate Study in Communication	3
7600:603	Empirical Research in Communication	3
7600:624	Survey of Communication Theory	3
	or	
7600:625	Theories of Mass Communication	3
7600:670	Communication Criticism	3

School coursework – 12 credits.

Graduate electives – 6 credits.

Thesis (699) or Project/Production (698) – 6 credits.

Total – 36 credits.

- Comprehensive examination required for students not pursuing a thesis, project, or production after 24 credits of coursework, including all core courses.
- Advancement to candidacy. Registration for six (6) credits of Thesis (699) or Project/Production (698).
- Presentation and defense of a thesis/project/production:

The thesis, project, or production requirement is designed to be the culmination of the student's academic program and involves the conceptualization, design and execution of an academic, practical, or aesthetic problem in a manner which requires a high level of substantive, methodological, technical, and written skills. These skills may be demonstrated in any of the three types of activities, depending on the student's background and career orientation.

## Theatre Arts

The School of Dance, Theatre, and Arts Administration offers a master of arts degree. The following will qualify the student in the field of theatre.

- Complete the general requirements for admission to the Graduate School.
- Complete an undergraduate major in the area of proposed graduate work or equivalent work as approved by the coordinator of the graduate theatre program.

- Complete an oral defense of the thesis or thesis project.

**Continuous Enrollment Requirement:** Regarding the completion of 7800:699 *Master's Thesis*, students must enroll for one credit of 7800:690 each Fall and Spring semester until the thesis project is completed (approved).

## Theatre Option

Complete a minimum of 36 credits distributed as follows:

- School core courses - 24 credits:

7800:600	Introduction to Graduate Studies	3
7800:641	Problems in Directing	3
7800:645	Seminar in Dramatic Literature	3
7800:646	Graduate Acting: Techniques	3
7800:658	History of Theatre	3
7800:662	Seminar in Scenic Design	3
7800:699	Master's Thesis	1-6

- Graduate electives:

12 credits (to be selected from Theatre Arts, English, Communication, Music, etc., in consultation with the student's advisor or the graduate program coordinator.

## Arts Administration Option

- Complete a minimum of 45 credits.

- Required theatre arts courses (30-33) credits:

7800:600	Introduction to Graduate Studies in Theatre Arts	3
7800:605	Colloquium in the Arts	3
7800:665	Audience Development	3
7800:666	Principles of Arts Management	3
7800:682	Fund Raising and Grantsmanship in the Arts	3
7800:691	Arts Administration Practices and Policies	3
7800:692	Legal Aspects of Arts Administration	3
7800:698	Internship	3-6
7800:699	Master's Thesis	1-6

- Required business courses (9 credits):

6200:590	Special Topics in Accounting	3
6500:600	Management and Organizational Behavior	3
6600:600	Marketing Concepts	3
	or	
6600:630	Marketing of Services	3

- Electives in related fields (3-6 credits):

Options here include course work in business, computer science, urban studies, art, music, and theatre and dance.

- Complete an oral defense of the thesis.

- General electives 0-3

## Speech-Language Pathology and Audiology

This program, leading to the M.A. in speech-language pathology or an M.A. in audiology\*, is designed to lead to professional certification by the American Speech-Language-Hearing Association (ASHA) in speech-language pathology and/or audiology and licensure by the State of Ohio Board of Speech-Language Pathology and Audiology. To enter the program:

- Complete requirements for admission to the Graduate School.
- Hold an undergraduate major in the area of proposed graduate specialty or complete undergraduate work within one calendar year of application.
- Complete department requirements for admission which include submission of three letters of recommendation and Graduate Record Examination Aptitude Test results.
- Declare intent to major in either speech-language pathology or audiology.

Speech-language pathology and audiology majors are accepted for entrance into the program only for Fall Semester. Applications for admission should be received by February 15th.

\* Degree name changes pending approval of Ohio Board of Regents.

### Degree Requirements

- The master's thesis is optional for students in speech-language pathology and audiology. All students will successfully complete a course of study with a minimum of 38 credits, two of which may be thesis credits for students electing the thesis option. Students in the non-thesis option also will write comprehensive examinations during their final semester. Academic requirements within the school include:

For speech-language pathology majors:

7700:611	Research Methods in Communicative Disorders I	3
7700:628	Topics in Differential Diagnosis of Speech and Language Disorders	2

7700:650	Advanced Clinical Practicum: Differential Diagnosis	1
At least two credits from the following:		
7700:651	Advanced Clinical Practicum: Voice	1
7700:652	Advanced Clinical Practicum: Fluency	1
7700:655	Advanced Clinical Practicum: Articulation	1
7700:656	Advanced Clinical Practicum: Language	1

**For audiology majors:**

7700:611	Research Methods in Communicative Disorders I	3
7700:612	Research Methods in Communicative Disorders II	2
or		
7700:699	Master's Thesis	4-6
7700:654	Advanced Clinical Practicum: Diagnostic Audiology	1
7700:657	Advanced Clinical Practicum: Rehabilitative Audiology	1

The student must take four credits of 7700:695 *Externship: Speech Pathology and Audiology*. Two credits of 5610:693 *Student Teaching in Speech Pathology* or 5610:692 *Student Teaching in Audiology* may be substituted for two credits of 7700:695. (Although 5610:692 and 5610:693 are 6 hours of credit, only 2 of those credits may be substituted for 7700:695). The audiology student must take 4 credits in speech-language pathology, and the speech-language pathology student must take 4 credits in audiology. It is recommended that the speech-language pathology major elect 7700:639 *Advanced Clinical Testing* to fulfill this requirement.

- The following limitations on work toward the degree may be exceeded only with the approval of two-thirds of the school's graduate faculty:
  - no more than 4 credits of workshop courses.
  - no more than 6 credits of directed study course work (including 7700:697); and
  - no more than 6 credits taken in disciplines other than communicative disorders.
- Only 7 credits of clinical practicum may be applied toward completion of degree requirements. These 7 credits may consist of externship, student teaching (maximum of 2 credits), and in-house practicum. However, the student may wish, or be required, to complete one or more practica in addition to degree requirements. Only 2 credits of student teaching (5610:692 or 5610:693) can be counted toward degree requirements. Students must be registered for clinical practicum, externship or student teaching during any academic period in which they are involved in in-house practicum, externship or student teaching.

## Social Work

The Master of Social Work Program is a joint degree program administered by Cleveland State University and The University of Akron. The two-year program began in January 1995 with a new class beginning each Fall Semester on both campuses. Distance learning technology, which utilizes interactive video and audio systems, will link faculty and students at the two institutions. The degree program is in candidacy status with the Council on Social Work Education.

Students accepted into the graduate program leading to a master's degree in social work must register only for 600 level courses. Graduate courses taken at the 500 level are not applicable for the graduate degree program in social work, but can be used (with approval) as an elective for other University of Akron graduate programs.

**Admission Requirements:**

- Meet the general Graduate School requirements for admission.
  - An undergraduate major in social work or a related field.
  - Have a minimum grade point average of 3.00 in social work and behavioral science courses taken prior to application for admission. A minimum of 8 courses is required in this area.
  - Submit 3 letters of reference.
  - Submit an essay of 3-5 typed pages explaining:
    - a) why he/she wants to be a social worker;
    - b) why a graduate degree is felt to be necessary to fulfill his/her personal or professional objectives;
    - c) his/her views regarding diversity in society;
    - d) a situation in which he/she was the recipient/provider of help, emotionally, socially, or economically.
- A description of any social work/human service work experience must be submitted.

**Program Requirements:**

- Complete a minimum of 60 graduate credits of approved courses in social work. Up to 9 credits of graduate-level electives outside the department may be included in the program. There is no foreign language requirement.
- Complete an approved program of courses which include the following required courses:

**First Year Professional Foundation:**

– Fall Semester

7750:601	Foundation Field Practicum	3
7750:609	Social Work Practice with Small Systems	3
7750:622	Fundamentals of Research I	3
7750:631	Human Behavior and Social Environment: Small Social Systems	3
7750:646	Social Welfare Policy I	3

– Spring Semester

7500:602	Foundation Field Practicum	3
7750:605	Social Work Practice with Large Systems	3
7750:611	Dynamics of Racism and Discrimination	3
7750:623	Fundamentals of Research II	3
7750:632	Human Behavior and Social Environment: Large Systems	3

**Second Year Concentrations (Direct Practice):**

– Fall Semester

7750:603	Advanced Field Practicum	3
7750:607	Advanced Practice with Small Systems I	3
7750:647	Social Welfare Policy II	3
7750:663	Psychopathology and Social Work	3
	One elective	3

– Spring Semester

7750:604	Advanced Field Practicum	3
7750:608	Advanced Practice with Small Systems II	3
7750:664	Single System Design	3
	Two electives	6

**Second Year Concentrations (Macro Practice):**

– Fall Semester

7750:603	Advanced Field Practicum	3
7750:647	Social Welfare Policy II	3
7750:674	Community, Economic Systems and Social Policy Analysis	3
7750:773	Introduction to Community Organization and Planning	3
	One elective	3

– Spring Semester

7750:604	Advanced Field Practicum	3
7750:671	Social Work Administration	3
7750:672	Strategies of Community Organization	3
7750:675	Program Evaluation	3
	One elective	3

# College of Nursing

Cynthia F. Capers, R.N., Ph.D., *Dean*

Linda Linc, R.N., Ph.D., *Interim Associate Dean of Graduate Program*

Elaine Nichols, R.N., Ed.D., *Associate Dean of Undergraduate Program*

Phyllis Fitzgerald, R.N., Ph.D., *Assistant Dean of Student Affairs*

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## Mission Statement

As an integral part of The University of Akron, the College of Nursing promotes the general mission of The University of Akron. The college offers diverse and comprehensive nursing education programs at the undergraduate and graduate levels. The programs of study, based on professional standards, prepare individuals to provide nursing care in a variety of settings. The College of Nursing supports nursing research that contributes to the health and well-being of society. The college is committed to serving culturally, racially, and ethnically diverse populations. Through academic and community collaboration, the college promotes excellence in nursing education, research, practice, and service.

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## Goals

- Prepare generalist and advanced practice nurses who are eligible for initial licensure and for certification.
- Provide a foundation for lifelong commitment to professional development and scholarship through continuing education and advanced study at the master's and doctoral levels.
- Prepare nurses who are sensitive in caring for diverse populations in a variety of settings.
- Prepare professional practitioners who integrate leadership roles and ethical standards in a continuously changing health care arena and society.

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## Philosophy

The College of Nursing faculty believe that the foci of professional nursing are individuals, families and communities.

*The Individual* is seen as a complex whole whose existence involves patterns, dynamic change, transformation and interdependence. The individual interrelates within the environment in biological, psychological, social, spiritual, cultural and other dimensions. The individual is unique and universal. The individual is a thinking, feeling, interacting, evolving, creating, valuing being.

*Families* are individuals dynamically connected with each other over time in traditional and nontraditional family configurations.

*Communities* are groups of people with one or more common characteristics who are in relationship to one another and may or may not interact.

*Health* is comparative, dynamic, multidimensional and has personal meaning. It includes disease, nondisease and quality of life. People have the right to participate in decisions affecting and effecting personal health.

*Environment* includes all living and nonliving dimensions with which the individual, family and community have interrelationships. The dynamic environmental interrelations define and establish rules for health and modes of action.

*Nursing* is an art and a science. The discipline of nursing is concerned with individual, family and community and their responses to health within the context of the changing health care environment. Professional nursing includes the appraisal and the enhancement of health. Personal meanings of health are understood in the nursing situation within the context of familial, societal and cultural meanings. The professional nurse uses knowledge from theories and research in nursing and other disciplines in providing nursing care. The role of the nurse involves the exercise of social, cultural, and political responsibilities, including accountability for professional actions, provision of quality nursing care, and community involvement.

*Education* is an individualized, life-long process. Learning includes the individual's interrelations with the environment, knowledge and skill acquisition, development of critical thinking, and self awareness. Self-expression enables the student to respond to clients who have unique human values and cultural heritage. Each nursing student brings attitudes, beliefs, values, feelings, knowledge and experience into the learning environment. These variables influence learning that occurs

through continual construction and reconstruction of experience in relation to environmental influences.

Nursing education at the baccalaureate level synthesizes knowledge from nursing, humanities, social, cultural, physical and natural sciences to operationalize clinical decision-making. The student is prepared to function as nurse generalist in a variety of settings. Faculty and student continually seek to refine the commitment to and understanding of the relationship between theory and practice. Students are encouraged to become self-directed, collaborative, interdependent and independent. These variables are the foundation for life-long learning and professional development.

Nursing education at the master's level builds upon baccalaureate nursing education and provides foundation for doctoral study. Graduate education prepares advanced practice nurses with expertise in critical thinking and decision making, effective communication, and therapeutic interventions. Through a variety of learning experiences, master of science in nursing students analyze and use theoretical formulations and research findings in advanced practice.

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## MASTER OF SCIENCE IN NURSING

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### Accreditation

The master's degree programs are fully accredited by the National League for Nursing Accreditation Commission (NLNAC). NLNAC is a resource of information regarding tuition, fees, and length of program and can be contacted at: 350 Hudson Street, New York, New York 10014, 1-888-669-9656 extension 153.

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### Characteristics of the Graduate\*

Upon completion of the program graduates will be able to:

- Incorporate theories and advanced knowledge into nursing practice.
- Demonstrate competence in selected role(s).
- Identify researchable nursing problems and participate in research studies in advanced nursing practice.
- Use leadership, management, and teaching knowledge and competencies to influence nursing practice.
- Assume responsibility for contributing to improvement in the delivery of health care and influencing health policy.
- Assume responsibility for contributing to the advancement of the nursing profession.

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### Admission

- Baccalaureate degree in nursing from NLN-accredited nursing program.\*\*
- 3.00 GPA on a 4.00 scale for all previous college work.
- Miller Analogies Test taken within the last five years with a minimum score of 50 or GRE taken within the last five years. During the past three years, the range of GRE scores has been: verbal 400-614, quantitative 400-695, and analytical 400-640.
- Three (3) letters of reference from a recent employer; a member of the nursing profession; a former faculty member.
- 300-word essay describing professional goals.
- Interview prior to admission to the program.
- Current state of Ohio license to practice nursing and evidence of malpractice insurance.
- Prerequisite course requirements: Undergraduate Statistics, Nursing Research, Basic Health Assessment and Computer Skills. Graduate Level Statistics.

A one year experience in an area where critical care and emergencies occur is required for all students admitted to the nurse anesthesia specialty.

Applicants who are certified nurse practitioners will be evaluated and have their program planned on an individual basis.

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### Admission Procedures

The student secures application for Graduate School from the Office of the Dean of the Graduate School, The University of Akron, or the Office of Student Affairs, College of Nursing. Criteria specific for admission to the Graduate Nursing Program may be secured from the Associate Dean of the Graduate Program in Nursing or the Office of Student Affairs.

A graduate admissions committee of the College of Nursing will review all applications and make recommendations to the associate dean regarding the applicant's status. The associate dean will send recommendation to the dean of the Graduate School, who will notify the student of admission status.

Applications received in the graduate office of the College of Nursing will be reviewed when the file is complete to facilitate the admissions process.

\*National League for Nursing.

\*\*A baccalaureate degree in nursing from a foreign university which is recognized by The University of Akron.

## Instructional Program

The Master of Science in Nursing curriculum includes 36 credit hours of study and focuses on nursing care of vulnerable populations in episodic and long term care situations. Areas of concentration include Adult Health Nursing, Liaison-Community Mental Health Nursing, Child and Adolescent Health Nursing, and Gerontological Nursing. Graduates are prepared for advanced practice roles in education, administration, clinical nurse specialization, or nurse practitioner. The curriculum is based on theory and research both in nursing and in related disciplines. It provides the foundation for doctoral study and for ongoing professional development.

The Master of Science program in Nurse Anesthesia includes 44 credit hours of study and focuses on the master's preparation of certified registered nurse anesthetists (CRNA).

## Nursing Core

The core consists of 17 credits which span the curriculum. These courses encompass advanced theory, research and practice.

## Nursing Research

All students enroll in a research core for a total of 7 credits: 8200:613, *Nursing Inquiry I* and 8200:699 *Master's Thesis* or 8200:618 *Nursing Inquiry II*.

## Advanced Practice Roles

Options are provided for roles of educator, administrator, clinical nurse specialist, nurse practitioner, or nurse anesthetist.

The graduate nursing curriculum requires between 36 and 45 credits, depending on the Advanced Practice Role selected by the student.

Core courses required of all students:

8200:608	Pathophysiological Concepts of Nursing Care †	3
8200:603	Theoretical Basis for Nursing	3
8200:605	Computer Applications in Nursing	2
8200:607	Policy Issues in Nursing	2
8200:613	Nursing Inquiry	3
8200:618	Nursing inquiry II	4-6
	or	
8200:699	Master's Thesis	1-6

Functional role courses selected by students based upon area of specialty.

### • Education:\*\*

8200:682	Nursing Curriculum Development	3
8200:683	Evaluation in Nursing Education	3
8200:684	Practicum: The Academic Role of the Nurse-Educator	6

### • Administration:

6200:632	Fiscal Management in Nursing Administration	3
8200:630	Resource Management in Nursing Settings	3
8200:635	Organizational Behavior in Nursing Settings	3
8200:638	Practicum Administration I	5
8200:639	Practicum Administration II	5

### • Nurse Anesthesia\*\*

The Anesthesia Track is accredited by the Council on Accreditation of Nurse Anesthesia Programs.

3100:561	Human Physiology I	4
3100:562	Human Physiology II	4
8200:640	Scientific Components of Nurse Anesthesia	3
8200:641	Pharmacology for Nurse Anesthesia I	3
8200:643	Principles of Anesthesia I	4
8200:644	Pharmacology for Nurse Anesthesia II	3
8200:645	Principles of Anesthesia II	4
8200:647	Professional Role Seminar	2
8200:649	Nurse Anesthesia Residency	0

### • Child and Adolescent Health (40 credits and meets eligibility requirement for certification) (see advisor for additional course in pediatric nutrition, 2 credits)

8200:650	Pediatric/Adolescent Assessment	2
8200:651	Child and Adolescent Health Nursing I	4
8200:655	Child and Adolescent Health Nursing II	4
8200:656	Pharmacology for Child and Adolescent Health Nursing	3

8200:657	Child and Adolescent Health Nursing III	4
8200:659	Practicum: Child and Adolescent Health Nursing	4

### • Liaison-Community Mental Health Nursing \*\*\*

5600:720	Topical Seminar: Guidance and Counseling (DSM IV)	3
8200:612	Advanced Clinical Pharmacology	3
8200:661	Liaison-Community Mental Health Nursing I	3
8200:662	Psychopharmacology	2
8200:665	Liaison-Community Mental Health Nursing II	4
8200:667	Liaison-Community Mental Health Nursing III	4
8200:669	Practicum: Liaison-Community Mental Health Nursing	3

### • Adult Health

8200:671	Adult Health Nursing I	3
8200:675	Adult Health Nursing II	4
8200:677	Adult Health Nursing III	4
8200:679	Practicum: Adult Health Nursing	3

### • Gerontological Nursing\*\*\*

8200:621	Gerontological Nursing I	3
8200:625	Gerontological Nursing II	4
8200:627	Gerontological Nursing III	4
8200:629	Practicum: Gerontological Nursing	3

### • Clinical Nurse Specialization\*\*\*

8200:615	Advanced Clinical Practice Seminar	2
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### • Adult Nurse Practitioner Track (43 credits and meets eligibility requirement for certification)

8200:671	Adult Health Nursing I	3
8200:675	Adult Health Nursing II	4
8200:677	Adult Health Nursing III	4
8200:679	Practicum: Adult Health Nursing	3
8200:690	Clinical Management I	2
8200:692	Clinical Management II	2
8200:694	Clinical Management III	2
8200:610	Advanced Adult/Gerontological Assessment	3
8200:612	Advanced Clinical Pharmacology	3

### • Gerontological Nurse Practitioner Track (43 credits and meets eligibility requirement for certification)

8200:621	Gerontological Nursing I	3
8200:625	Gerontological Nursing II	4
8200:627	Gerontological Nursing III	4
8200:629	Practicum: Gerontological Nursing	3
8200:690	Clinical Management I	2
8200:692	Clinical Management II	2
8200:694	Clinical Management III	2
8200:610	Advanced Adult/Gerontological Assessment	3
8200:612	Advanced Clinical Pharmacology	3

†Cognate electives may be substituted for this course for the Administrative track.

\*Students in education are required to take an additional 7 credits of Advanced Nursing in Child and Adolescent Health, Liaison-Community Mental Health, Adult Health, or Gerontological Nursing.

\*\*In addition to the listed courses, all nurse anesthesia students must complete a 15 month residency.

\*\*\*Students in Liaison-Community Mental Health, Adult Health, or Gerontological Nursing are required to take the 2 credit hour Advanced Clinical Practice Seminar.

# R.N.-M.S.N. PROGRAM

## Admission Policies

The R.N.-M.S.N. Program is a graduate program, and as such, applicants must meet the following admissions requirements:

- Current Ohio State license as a registered nurse and evidence of malpractice insurance.
- Grade-point average of 3.00 on a 4.00 scale for all previous college work.
- Three (3) letters of reference from a recent employer; a member of the nursing profession; a former faculty member.
- Miller Analogies Test taken within the last five years with a minimum score of 50 or Graduate Record Exam (GRE) taken within the last five years. During the past three years, the range of GRE scores has been: verbal 400-614, quantitative 400-695, and analytical 400-640.
- 300-word essay describing professional goals.
- Interview with selected faculty members and submission of a portfolio.
- Computer skills.

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## Curriculum

The R.N.-M.S.N. Sequence is designed for those registered nurses holding a diploma or associate degree in nursing who aspire to the Master of Science in Nursing degree. Students must complete 67 hours of prerequisite undergraduate coursework prior to acceptance into the Sequence. The R.N.-M.S.N. Sequence consists of bridge courses totaling 21 hours of upper-division baccalaureate coursework and a minimum of 36 hours of graduate coursework. Students will receive 46 hours of undergraduate by-passed credit after successful completion of all undergraduate course requirements. This is in accordance with the current University policy for by-passed credit. Upon successful completion of all program requirements, the student will receive the B.S.N. and M.S.N. degrees.

• R.N.-M.S.N. Bridge Courses:

8200:225	Health Assessment	3
8200:435	Nursing Research	3
8200:460	Issues and Roles of the Profession of Nursing	3
8200:465	Concepts and Theories of Professional Nursing	3
8200:470	Community Health Nursing	4
8200:485	Leadership Roles of Professional Nursing	5

# College of Polymer Science and Polymer Engineering

Frank N. Kelley, Ph.D., *Dean*

Rudolph J. Scavuzzo, Ph.D., *Associate Dean*

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## HISTORY

The University of Akron has been a focus for education and research in polymer science since 1910 when Professor Charles M. Knight began offering courses in rubber chemistry. Master's theses treating rubber chemistry on the University library shelves date to 1920. The University began developing major laboratories in 1942 under the leadership of Professor G.S. Whitby, and the JA program played a significant role in the synthetic rubber industry of the U.S. government during World War II. An Institute of Rubber Research under the direction of Professor Maurice Morton was created in 1956, which became an Institute of Polymer Science in 1964. A Ph.D. program in Polymer Chemistry was introduced in 1956. In 1967, a Department of Polymer Science in the College of Arts and Sciences was formed which awarded M.S. and Ph.D. degrees in Polymer Science.

A Center for Polymer Engineering was created in 1983 and a Department of Polymer Engineering in the College of Engineering in January 1984 with Professor J. L. White as director and department head to give thrust to polymer processing and engineering applications.

In 1988 the College of Polymer Science and Polymer Engineering was established to consolidate the administration of the two academic departments, the Institute of Polymer Science and the renamed Institute of Polymer Engineering.

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## MISSION STATEMENT

The mission of the College of Polymer Science and Polymer Engineering is to serve its students through a high quality educational experience, incorporating both classroom and laboratory learning, as well as a stimulating research environment. Its graduates and former research associates provide a well-trained workforce for employers throughout the world, but especially for the State of Ohio. With the generation of new knowledge from research and the application of that knowledge, the College serves society with benefits to both the economy and the environment.

- The primary purpose of the College is to educate its students in the science and engineering of polymers. Since the College is involved principally in graduate level education (M.S. and Ph.D.), its students are taught the skills of research by the faculty; occasionally assisted by visiting scientists, and post-doctoral associates.
- The involvement of the College faculty, students and associated staff in research provides a further purpose, i.e., to develop new knowledge concerning polymeric materials and processes, and to disseminate that knowledge to the broader community of researchers, technologists, and manufacturers who employ that knowledge to their own aims.
- The College provides a variety of services through its institutes and centers to aid the economic and cultural development of our society. Individual faculty members provide services as consultants to industry, government, and civic institutions, concerning the developments in knowledge and applications of polymers.
- An additional function of the College is to provide training for those individuals who wish to improve their skills and knowledge concerning various types of polymers, their properties, processes and uses. Undergraduate students from other colleges within the University participate in specialized courses taught by the polymer college faculty as they pursue their traditional degree programs. Also, a variety of non-credit offerings are presented as continuing education, intensive short courses, and seminars.

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## DESCRIPTION

The College of Polymer Science and Polymer Engineering carries out a program of research and education, primarily at the graduate level, and serves as a major intellectual resource for the scientific and technological development of polymers and related materials and processes. The college consists of the Department of Polymer Science, the Department of Polymer Engineering, the Maurice Morton Institute of Polymer Science and the Institute of Polymer Engineering.

The Department of Polymer Science and The Institute of Polymer Science, emphasize polymer synthesis, the physical chemistry, physics and mechanical behavior and technology of polymers, and many of their applications. The Department of Polymer Engineering and the Institute of Polymer Engineering, emphasize polymer processing (including reactive processing), solid state structure/morphology and properties of polymers as related to process history as well as engineering analysis and design. Collaborative research among the faculty in the two departments is common and provides a unique environment and capability for solving modern-day problems. This provides a fertile environment for students to obtain multidisciplinary training.

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## ADMISSION REQUIREMENTS

Admissions to the graduate program in the college are competitive. The departmental admission committees carefully consider each applicant. Early application is suggested.

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## DEPARTMENT OF POLYMER SCIENCE

Students with an undergraduate degree in chemistry, physics, or engineering and a grade point average of 2.75/4.0 or better are admissible. Students holding a degree in biology or natural sciences usually need additional courses on the undergraduate level in physics, physical and analytical chemistry. For such students, a special non-degree admission may be given for one or two semesters, followed by a full admission upon a student's successful completion of the remedial undergraduate courses. All applications must be supported by at least one letter of recommendation from a teacher or supervisor that the candidate is able to handle independent scientific research. GRE scores are recommended with each application.

A student with a M.S. in the sciences from another university can be admitted to the Ph.D. program. Two letters of recommendation are required in such cases to be certain that the student is likely to be successful in doctoral research.

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## DEPARTMENT OF POLYMER ENGINEERING

Students with an undergraduate degree in Chemical Engineering, Mechanical Engineering or related degrees with a grade point average of 2.75/4.0 or better are admissible. Students holding a degree in the natural sciences usually need additional undergraduate engineering courses, which are required prerequisites for core courses. For such students, depending upon their background, a special non-degree admission may be given followed by full admission upon successful completion of a series of required remedial courses.

A student with a M.S. in Mechanical or Chemical Engineering from another university can be admitted to the Ph.D. program. Two letters of recommendation are required in such cases to be certain that the student is likely to be successful in doctoral research.

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## DOCTOR OF PHILOSOPHY

Students may pursue the Doctor of Philosophy degree in either Polymer Science or Polymer Engineering.

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### Doctor of Philosophy in Polymer Science

An interdisciplinary program leading to the Doctor of Philosophy in Polymer Science is administered by the Department of Polymer Science. Graduates from the three main disciplines (chemistry, physics and engineering) are guided into the appropriate courses of study and research in that field under the supervision of a faculty member. Research facilities of the Institute of Polymer Science are available for dissertation research. Students may be admitted directly to the Ph.D. program upon screening of their qualifications and recommendation by the department head and dean.

In addition to satisfying the general requirements of the Graduate School, a student working toward the Doctor of Philosophy in Polymer Science must meet the following requirements:

- Complete a course of study prescribed by the student's advisory committee based on the committee's judgment of the student's background and on the result of any special examinations it might impose. This course will consist of a minimum of, but usually more than, 36 credits in graduate courses, or their equivalent, plus sufficient Ph.D. research credits to make a total of 84 credits (exclusive of Master of Science thesis credit). Credits for participation in either Polymer Science or Polymer Engineering seminars do not apply toward the degree. At least 18 credits of graduate course work and all dissertation credits must be completed at the University.

There is a university minimum residence time requiring one year, although graduate students starting with a B.S. or B.A. typically spend 4 years in residence.

- Completion of 18 credits among the following core courses (2 credits each) in polymer science:

4 credits of polymer chemistry courses:

9871:601	Polymer Concepts
9871:602	Synthesis and Chemical Behavior of Polymers
9871:704	Condensation Polymerization
9871:705	Free Radical Reactions in Polymer Science
9871:706	Ionic and Monomer Insertion Reactions

4 credits of polymer physical chemistry courses:

9871:674	Polymer Structure and Characterization
9871:675	Polymer Thermodynamics

4 credits of polymer physical property courses:

9871:631	Physical Properties of Polymers I
9871:632	Physical Properties of Polymers II

4 credits of polymer engineering and technology courses:

9871:701	Polymer Technology I
9871:702	Polymer Technology II
9871:703	Polymer Technology III

3 credits of polymer science laboratory:

9871:613	Polymer Science Laboratory
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- Completion of 18 credits of elective courses appropriate to each student's area of interest.
- Pass eight cumulative examinations which are given at monthly intervals during the academic year. The candidate is urged to begin these examinations early in the graduate program.
- Complete 9871:607,8 Polymer Science Seminar I and II.
- Attendance at and participation in seminar-type discussions scheduled by the department. Credits for participation in either polymer science or polymer engineering seminars do not apply toward the degree.
- Present a public/departmental seminar on the completed research.
- Pass an oral examination upon completion of a research dissertation.
- Demonstrate competency in computer programming.
- Pass the general requirements for the Doctor of Philosophy degree.
- Satisfy the foreign language requirement for the doctoral degree by meeting the requirements of Plan A, B, or C as specified by the student's advisory committee. Appropriate research skills for Plan C are to be specified by the department on the basis of the student's area of specialization and intended research. These skills include proficiency in computer programming language, special mathematical methods, applied statistical analysis, and special literature search techniques.

## Doctor of Philosophy in Engineering (Polymer Engineering)

The Department of Polymer Engineering administers a graduate program in which graduate students, with primarily engineering backgrounds, are guided through a course of study and research under the supervision of a faculty member. Students may be admitted directly to the Ph.D. program upon screening of their qualifications and recommendation by the department head and dean.

Students in Polymer Engineering must satisfy the general requirements of the Graduate School and the department as stated below:

- Successfully complete a qualifying examination within three semesters after admission into the program. The examination shall cover graduate courses that the student has completed and basic undergraduate topics.
- Complete courses in the plan of study developed by the student advisory committee on the basis of the qualifying examination. A minimum of 90 credits of graduate work must be earned, including all course requirements listed for the Master of Science in Polymer Engineering degree.
- Pass a candidacy examination which may be taken after 90 percent of the course work specified in the plan of study has been completed.
- Pass an oral examination in defense of the dissertation.

## MASTER'S DEGREE

Students may pursue Master of Science degrees in either Polymer Science or Polymer Engineering.

### Master of Science in Polymer Science

- A minimum of 24 credits in appropriate courses in biology, chemistry, mathematics, physics, polymer science and engineering as prescribed by the advisory committee:

Completion of 11 of credits in the following required core courses in polymer science: 9871:601 Polymer Concepts; 613 Polymer Science Laboratory; 631 Physical Properties of Polymers I; 674 Polymer Structure and Characterization; 701 Polymer Technology.

Completion of 13 credit hours of elective courses appropriate to each student's area of interest.

- Completion of a research project (9871:699) and the resulting 6 credits.
- Attendance at and participation in seminar-type discussions scheduled by the department. Credits for participation in either polymer science or polymer engineering seminars do not apply toward the degree.
- Demonstrated competence in computer skills.
- At least 12 credits of graduate coursework and all these credits must be completed at the University.

### Master of Science in Engineering (Polymer Engineering Specialization)

The major emphases of the graduate program in polymer engineering are in polymer processing, engineering performance and structural and rheological characterization of polymers.

The academic program requires the completion of 33 credits: 12 credits of core courses, 3 credits of approved mathematics courses, 6 thesis credits, and 12 credits of approved electives.

- Polymer engineering core:

9841:611	Structural Characterization of Polymers with Electromagnetic Radiation	2
9841:621	Rheology of Polymeric Fluids	3
9841:622	Analysis and Design of Polymer Processing Operations I	3
9841:631	Engineering Properties of Solid Polymers	2
9841:641	Polymer Materials Engineering Science	2
	Total	12

- Polymer engineering elective:

9841:601	Polymer Engineering Seminar	1
9841:623	Analysis and Design of Polymer Processing Operations II	3
9841:642	Engineering Aspects of Polymer Colloids	2
9841:651	Polymer Engineering Laboratory	2
9841:661	Polymerization Reactor Engineering	3

- Approved engineering and science elective (a minimum of 3 credits of approved science or mathematics required):

3450:	Approved Mathematics	3
4300:681	Advanced Engineering Materials	3
4800:622	Continuum Mechanics	3
9871:613	Polymer Science Laboratory	3
9871:674	Polymer Structure and Characterization	2
9871:675	Polymer Thermodynamics	2

- Thesis:

9841:699	Master's Thesis	6
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- Requirements:

Polymer Engineering Core	12
Approved Electives	12
Approved Mathematics	3
Thesis	6
Total	33

- Attendance at and participation in department seminars as directed by the advisory committee is required.

# Interdisciplinary and Certificate Programs of Study

## Overview

To add to the dimensions of the traditional disciplines, the University has established interdisciplinary and interdepartmental programs of study. In addition to a major, the student may elect to pursue one of these programs.

Interdisciplinary Studies programs feature courses which integrate and analyze issues and concepts from more than one field. The goal of this type of study is to place knowledge into greater perspective than would be possible through any one traditional field. This is accomplished by taking courses from a variety of departments as well as courses which may be team taught. Interdisciplinary Studies and certificate programs will include coursework designated as 1800:—.

Upon completion of any of these programs, a statement will be placed on the student's permanent record indicating the area of concentration. The certificate indicating the area of concentration will be awarded when the student completes requirements for a degree unless otherwise specified.

## ADDICTION COUNSELING

David M. Weis, Ph.D., *Department Chair*

This certificate program represents specialty training in addiction counseling. The curriculum emphasizes the empirical foundations for theory, assessment, treatment planning and intervention with addictive disorders. Each student will complete an internship and participate in addiction research. This program will be of special interest to graduate students, and graduate degreed professionals in counseling or related behavioral sciences such as psychology, social work, and nursing.

### Admission

Persons are eligible for admission to the Graduate Certificate Program in Addiction Counseling if they are currently enrolled in a master's degree program in counseling or a closely related field or currently hold a master's degree in counseling or a closely related field. To participate in the program the student should:

- Be formally admitted to The University of Akron as a degree seeking or a special non-degree graduate student.
- Make written application to the program to the Counselor Education Admissions Committee in the Department of Counseling and Special Education.
- Receive written notification for admission from the Counselor Education Admissions Committee.
- Consult with the Counselor Education Internship Coordinator to plan for an internship in an appropriate addictions counseling setting.

### Requirements

5600:670	Addiction Counseling I: Theory and Practice	3
5600:732	Addiction Counseling II: Assessment and Treatment Planning	3
5600:734	Addiction Counseling III: Models and Strategies of Treatment	3
5600:685	Internship in Counseling	6-7
	Total credit hours	15-16

## APPLIED POLITICS

John C. Green, Ph.D., *Director*

The Ray C. Bliss Institute and the Department of Political Science have combined to offer a Certificate Program in Applied Politics for graduate students. The Certificate Program in Applied Politics offers course work in the history, organization and management of campaigns intended to influence the outcome of political decisions. Working from a set of core courses, students are allowed to concentrate in the area of applied politics of greatest interest—campaigns, communications, lobbying, political parties, etc. Believing that democracy is best served by having active and informed citizens, the certificate is designed for all students, no matter what their degree program as long as they have a deep interest in practical politics.

### Requirements

Persons are eligible for admission to the Certificate Program in Applied Politics if they have been admitted to study as full-time students, special, or non-degree in any department of the University. Students who are pursuing a graduate degree in other departments at the University may be admitted to the Master's level certificate program upon the recommendation of the chair/director of the department/school in which they are enrolled. Students shall seek admission to this program by filing an application with the Bliss Institute. The student shall schedule courses with the assistance of an advisor at the earliest possible time.

#### Core Courses (required—12 credits):

3700:570	Campaign Management I	3
3700:571	Campaign Management II	3
3700:672	Seminar: Political Influence and Organizations	3
3700:695	Internship in Government and Politics	3

#### Electives:

Six credits selected from the following (at least 3 credits must be from 3700:502, 540, 572, 573, 574, 575, 576, or 630):

3700:502	Politics and the Media	3
3700:540	Survey Research Methods	3
3700:572	Campaign Finance	3
3700:573	Voter Contact and Elections	3
3700:574	Political Opinion, Behavior and Electoral Policies	3
3700:575	American Interest Groups	3
3700:576	American Political Parties	3
3700:630	Seminar in National Politics	3
7600:691	Adv. Communication Studies: Communication in Political Campaigns	3

Additional 3 credits from above or from approved courses from Political Science, Communication or other departments. Students must maintain at least a 3.0 average in their course work for the certificate.

### Certificate

Political science majors will, upon completion of the program, be awarded an M.A. degree in Political Science with a Certificate in Applied Politics. Majors in other disciplines will have the Certificate noted on their permanent record.

## CASE MANAGEMENT FOR CHILDREN AND FAMILIES

Helen K. Cleminshaw, Ph.D., *Coordinator*

### Program

This certificate program is a special course of study which can be added to any graduate degree program. It may also be completed by a non-degree graduate student with special permission from the director of the Center for Family Studies. This certificate represents a concentration in theoretical and practical knowledge in collaborative cross-systems case management for children and families in the context of community-based services. This course of study promotes collaboration among disciplines and services.

### Admission

To participate in the program the student should:

Be formally admitted to The University of Akron as a postbaccalaureate, graduate or non-degree graduate student.

Make written application to the program and receive written notification of admission from The Center for Family Studies.

### Requirements

#### Core:

Students should successfully complete all three of the core courses listed below. However, the first two courses plus three hours of electives must be completed prior to the student's enrollment in the practicum course.

7400:561	Case Management for Children and Families I	3
7400:562	Case Management for Children and Families II	3
7400:563	Practicum in Cross-Systems Case Management for Children and Families	3

#### Electives:

Students must successfully complete six credits of coursework selected from the various departmental courses listed below.

- Home Economics and Family Ecology

7400:501	Family-Life Patterns in the Economically Deprived Home	2
7400:504	Adolescence in the Family Context	3
7400:540	Family Crisis	3
7400:546	Culture, Ethnicity and the Family	3
7400:602	Family in Life-Span Perspective	3
7400:607	Family Dynamics	3
7400:610	Child Development Theories	3
7400:651	Family and Consumer Law	3
7400:665	Development in Infancy and Early Childhood	3

- Home-Based Intervention

1820:503	Home-Based Intervention Theory	3
1820:504	Home-Based Intervention Techniques and Practice	3

## COMPOSITION

Martin McKoski, Ph.D., *Director*

### Requirements

To be eligible for the certificate in composition, a person must be admitted to the University as a graduate student (with either full or provisional status). An eligible person interested in the program should contact the program director. Five courses in composition and linguistics are required. Other appropriate English courses in composition or linguistics may be substituted as optional courses with the permission of the director.

#### Required Courses:

3300:676	Seminar: Theory and Teaching of Basic Composition	3
3300:673	Theories of Composition	3
3300:674	Seminar Research Methodologies in Composition	3

#### Optional Courses:

3300:570	History of English Language	3
3300:571	U.S. Dialects: Black and White	3
3300:589	Seminar in English: Grammatical Structures of Modern English	3
3300:575	Theory of Rhetoric	2
3300:589	Seminar: Sociolinguistic	3
3300:670	Modern Linguistics	3
3300:689	Seminar in English: Stylistics	3
3300:689	Seminar in English: Contextual Linguistics	3

## DIVORCE MEDIATION

Helen Cleminshaw, Ph.D., *Coordinator*

### Requirements

This graduate certificate program in divorce mediation requires a minimum of 15 graduate credits dependent upon previous educational background. The program has been designed to serve the practicing or prospective divorce mediator.

All applicants to the program should have previously earned a law degree or a master's degree (at minimum in the behavioral sciences, such as psychology, social work, counseling, and marriage and family therapy, or child and family development). Applicants planning to pursue the certificate must apply to the Center for Family Studies and the Graduate School for admission as non-degree students. Persons currently working toward a doctorate or Juris Doctor at the University may participate in the certificate program as a cognate or minor. In this case, students must receive permission from their academic department as well as admission from the Center for Family Studies. Since the educational preparation prior to entry to this program will be quite diverse, the selection of courses within the certificate will vary among the participants. However, all students are expected to complete the core courses in addition to 10 credit hours selected from among several disciplines related to divorce mediation.

#### Core:

1800:601	Divorce Mediation	3
1800:602	Divorce Mediation Practicum	2

#### Select at least one from each area:

– Law		
9200:638	Family Law	3
7400:651	Family Consumer Law	3
– Accounting		
6200:601	Financial Accounting	3
9200:621	Accounting for Lawyers	3
– Family		
5600:655	Marriage and Family Therapy: Theory and Techniques	3
5600:667	Marital Therapy	3
7400:607	Family Dynamics	3

#### Electives:

Students who have already completed coursework in Law, Accounting or Family may select from courses listed below:

5600:647	Career Counseling	3
5600:669	Systems Theory in Family Therapy	3
7400:540	Family Crisis	3
7400:590	Family and Divorce	2
7400:602	Family in Life Span Perspective	2
9200:684	Alternate Dispute Resolution	3

## GERONTOLOGY

Harvey Sterns, Ph.D., *Director*

Isadore Newman, Ph.D., *Associate Director*

Terry H. Albanese, Ph.D., *Program Coordinator*

*Gerontology Certificate Program; Practicum Coordinator*

Jerome Kaplan, Ph.D., *Program Coordinator,*

*Nursing Home Administrator Program*

### Requirements

This certificate program is a special course of study in gerontology that complements graduate degree programs in various departments and colleges throughout the University. Individuals who already hold undergraduate or graduate degrees may also pursue the certificate. The program represents a concentration involving current knowledge and research in gerontology. It adds another dimension to the knowledge and skills a student is able to offer in the many professions that are becoming specialized in research and service to adults and older adults. This course of study coordinates multidisciplinary training of personnel in adult development and aging and help to meet the critical shortage of trained individuals in the field of gerontology.

The undergraduate and graduate curriculum committees of the Institute for Life-Span Development and Gerontology will oversee this certificate program and certify through the director of the Institute that all requirements for the certificate have been completed.

A sequence of study is available in Nursing Home Administration through the Institute. The undergraduate certificate is included in the Ohio Board of Examiners of Nursing Home Administrators approved course of study in Nursing Home Administration which combines a Bachelor of Science in Industrial Management (Personnel Option) with a Certificate in Gerontology.

B.S./M.D. students may complete Practicum/Internship and electives from courses available from the Institute or the Office of Geriatric Medicine and Gerontology, NEUCOM.

### Admission

To participate in the program at the graduate level, a student must:

- Obtain admittance to The University of Akron Graduate School.
- Submit an application to the program countersigned by the student's major academic adviser.
- Participate in an interview with the Director or a designated faculty member of the Institute for Life-Span Development and Gerontology.
- Consult with the director or a designated faculty member to formulate a program of study.
- Receive written notification for admission from the director of the Institute for Life-Span Development and Gerontology.

### Program

Minimum: 18 credits.

#### Core:

3006:680	interdisciplinary Seminar in Life-Span Development and Gerontology	3
3006:695	Practicum/Internship	3
—:—	Research Methods Course	3*

#### Electives:\*\*

3006:686	Retirement Specialist	2
3006:690	Workshop – Women: Middle and Later Years	2
3006:690	Workshop – Aging: Process and Intervention	2
3700:580	Policy Problems: Aging***	3
3750:620	Psychology Core II: Developmental, Perceptual, Cognitive	4
3750:727	Psychology of Adulthood and Aging	4
3850:678	Social Gerontology	3
3850:681	Cross Cultural Perspectives in Aging	3
5400:541	Educational Gerontology Seminar	3
5400:661	Current Issues in Higher Education: Life-Span and Community Education	2
6500:687	Graduate Seminar in Health Services Policy and Administration or Health Services Systems Management (with permission)	3
6500:683	Health Services Systems Management (with permission)	3
7400:603	Family Relationships in Middle and Later Years	3
7400:550	Social Needs and Services for Later Adulthood and Aging	3

\*From student's home department

\*\*Select a minimum of three courses. A student is required to take two of the three electives outside the major or degree department. One credit workshop may be included as an elective, with permission.

\*\*\*Offered every other year

## HIGHER EDUCATION

Dianne Brown-Wright, Ph.D., *Coordinator*

### Requirements\*

This certificate program in higher education requires a minimum of 18 credits. The program of studies has been designed to serve the practicing or prospective college or university administrator or instructor.

### Admission

All applicants to the program should have previously earned a bachelor's degree. Special admission for concurrent studies toward a master's degree and the higher education certificate may be allowed for persons currently employed in higher education. Students interested in admission should first meet with the program coordinator. Persons wishing to pursue a master's degree in Educational Administration-Higher Education Option must, however, also apply to the Graduate School for admission to the program. Applicants wishing to pursue only the certificate program must apply to the Graduate School for admission as a special non-degree student.

### Program

Courses and internships in higher education are directed toward the study of administrative and academic operations of colleges and universities. Specific program options include: administration, student services, curriculum, and instruction option, a higher education teaching internship developed in conjunction with the student's major academic adviser and the center staff may be anticipated. Internships may be completed at the University or at one of several cooperating institutions.

#### Required:

5100:703	Seminar: History and Philosophy of Higher Education	3
5190:500	Introduction to the Study of Higher Education	3
5190:600	Advanced Administrative Colloquium in Higher Education	1
5190:601	Internship in Higher Education	2
5190:602	Internship in Higher Education Seminar	1
	Total	10

#### Options:

A student may select all three courses listed as "A" and omit "B" or may select an area of concentration and take one course from "A" under I, II, or III and the supporting course from "B" from the same heading:

#### Organization and Administration in Higher Education (I)

5190:515	Administration in Higher Education (A)	3
5190:525	Topical Seminar: Higher Education	3
5190:626	Organization and Policy Development in Higher Education (B)	3

#### Student Services in Higher Education (II)

5190:525	Topical Seminar in Higher Education	3
5190:526	Student Services in Higher Education (A)	3
5190:527	The American College Student (B)	3

#### Program Planning, Curriculum and Instruction in Higher Education (III)

5190:530	Higher Education Curriculum and Program Planning (A)	3
5190:635	Instructional Strategies and Techniques for the College Instructor (B)	3

Total hours required: 18.

\*The awarding of this certificate is not contingent upon completion of a degree program. Undergraduate certificate programs require a 2.00 grade-point average; graduate certificate programs require a 3.00 grade-point average.

## HOME-BASED INTERVENTION THERAPY

Helen K. Cleminshaw, Ph.D., *Coordinator*

### Program

This certificate program is a special course of study along with undergraduate and graduate degree programs in various departments and colleges throughout the University. Undergraduate students will earn the certificate upon graduation in their degree program. Individuals who already hold undergraduate or graduate degrees may also pursue the certificate. Students with an undergraduate degree who do not seek a graduate degree may pursue the certificate in the postbaccalaureate program. Students who already hold a graduate degree may be admitted to the program as non-degree graduate students. Students pursuing graduate degrees will receive their graduate certificate upon completion of the requirements for their graduate degree. The program represents a concentration in current theoretical knowledge and practice in home-based intervention. It adds another dimension to the knowledge and skills a student is able to offer in the many professions that relate to services to at-risk children and their families. This course of study coordinates multidisciplinary training of personnel in home-based intervention and helps to meet the need for trained professionals in home-based intervention.

The undergraduate and graduate curriculum committees of the Center for Family Studies will oversee the certificate program and certify through the Director of the Certificate Programs in Home-Based Intervention that all requirements for the certificate have been completed.

### Admission

To participate in the program at the graduate level, the student should:

- Be formally admitted to The University of Akron Graduate School.
- Make written application to the program countersigned by student's major academic adviser (if applicable).
- Have an interview with the Director of the Certificate Programs in Home-Based Intervention.
- Receive written notification for admission from the Director of the Certificate Programs in Home-Based Intervention.
- Consult with the Director of the Certificate Programs in Home-Based Intervention to formulate a program of study.

All students enrolled in the home-based certificate programs will enroll in the core course in Home-Based Intervention. Students enrolled in the undergraduate and postbaccalaureate program will enroll in the courses at the undergraduate level. Students admitted to the Graduate School as degree seeking or non-degree students will enroll in graduate courses. Graduate students enrolled in the core courses at the 500 level will have an additional graduate level project.

Students will complete a minimum of 18 hours of graduate credits in core and elective coursework. In order to earn the interdisciplinary certificate in Home-Based Intervention, the student must complete the following requirements within six years after beginning the program.

### Requirements

#### Core Courses:

1820:503	Home-Based Intervention Theory	3
1820:504	Home-Based Intervention Techniques and Practice	3
1820:505	Home-Based Intervention Internship	3-5

#### Eligibility Courses:

Students must have completed at least 9 credits of coursework in theoretical frameworks from their discipline or related areas follows:

#### Theoretical Frameworks:

- Systems Theory
 

3850:620	General Systems Theory	3
5600:643	Theories and Philosophy of Counseling	3
5600:655	Marriage and Family Therapy: Theory and Techniques	3
7400:607	Family Dynamics	3
- Developmental Theory
 

3850:512	Socialization: Child to Adult	3
7400:602	Family in Life Span Perspective	3
7400:605	Developmental Parent-Child Interactions	3
7400:610	Child Development Theories	3
- Therapeutic Theory
 

5600:651	Techniques in Counseling	3
5600:667	Marital Therapy	3
5600:669	Systems Theory in Family Therapy	3
7750:553	Social Work with Families	3

#### Elective Courses (9 credits):

Select one course from three different disciplines. (Must be outside student's major degree area)

#### Specific Skill Areas:

- Psychology
 

3750:530	Psychological Disorders of Children	4
3750:704	Theories of Personality	3
- Sociology
 

3850:550	Sociology of Mental Health	3
3850:688	Human Ecology	3
3850:753	Family and Health (Special Topics)	1-3
- Counseling
 

5600:550	Counseling Problems Related to Life/Death	3
5600:620	Multicultural Counseling	1-4
5600:620	Substance Abuse	1-4
5600:620	Human Sexuality	1-4
- Special Education
 

5610:540	Developmental Characteristics of Exceptional Individuals	3
5610:546	Developmental Characteristics of Behaviorally Disordered Individuals	3
5610:550	Working with Parents of MSPPR Individuals	3

5610.604	Education and Management Strategies for Parents of Exceptional Individuals	3
• Multicultural Education		
5630.582	Characteristics of Culturally Diverse Populations	3
• Home Economics and Family Ecology		
7400.501	Family-Life Patterns in the Economically Deprived Homes	2
7400.504	Adolescence in the Family Context	3
7400.506	Family Financial Management	3
7400.540	Family Crisis	3
7400.542	Human Sexuality	3
7400.546	Culture, Ethnicity, and the Family	3
7400.590	Workshop in Home Economics & Family Ecology: Family and Divorce	2
7400.596	Parent Education	3
7400.675	Conceptual Frameworks in Family Ecology	3
• Social Work		
7750.510	Minority Issues in Social Work Practice	3
7750.551	Social Work and Child Welfare	3
7750.552	Social Work and Mental Health	3
7750.554	Social Work in Juvenile Justice	3

## MID-CAREERS PROGRAM IN URBAN STUDIES

Gary M. Gappert, Ph.D., *Director*

### Requirements

The program will require the completion of 16 graduate credits in a single area or in several areas in the urban field. Upon the completion of the program, a certificate will be granted.

### Admission

A student must satisfy the requirements for entrance in graduate programs or have a bachelor's degree and the equivalent of five years' experience in a professional, administrative or leadership position, in which case the student shall be admitted as a non-degree student. A student may wish to pursue additional electives. However, a student admitted to this program will be limited to 20 credits. If the student wishes to pursue more than 20 credits, the student must be admitted to the M.A. program in urban studies.

### Program

The Mid-Careers Certificate Program in Urban Studies will require the successful completion of a plan of study which must include a minimum of 16 credits of work in existing courses offered by the Department of Public Administration and Urban Studies. The core program and areas of study are listed below. Electives will be chosen in consultation with the adviser from the approved list of courses. Courses offered by other departments will be accepted if they are urban related and will specifically contribute to the student's objectives.

#### Core:

3980.600	Basic Analytical Research	3
	or	
3980.601	Advanced Research and Statistical Methods	3

#### Options:

##### Geography/Urban Planning

3350.630	Introduction to Planning Theory	3
3350.600,1,2	Seminar: Urban Planning Design	3
3350.600,1,2	Seminar: Planning Theory and Innovation	3
	Elective(s)	4

##### Public Administration

3980.611	Introduction to the Profession of Public Administration	3
3980.640	Fiscal Analysis	3
3980.643	Introduction to Public Policy	3
	Elective(s)	4

##### Urban Research Methods

3980.670	Research for Futures Planning	3
3980.673	Computer Applications in Public Organizations	3
	Elective(s)	4

##### Urban Service Systems

3980.620	Social Services Planning	3
3980.621	Urban Society and Service Systems	3
3980.671	Program Evaluation in Urban Studies	3
	Elective(s)	4

##### Urban Studies

3980.602	History of Urban Development	3
3980.6—	Elective(s)	10

## PARENT AND FAMILY EDUCATION

Helen K. Cleminshaw, Ph.D., *Coordinator*

### Program

This certificate program is a special course of study which can be added to any graduate degree program. It may also be completed by a non-degree graduate student with special permission from the director of the Center for Family Studies. This certificate represents a concentration in theoretical and practical knowledge in parent and family education for community-based services. This course of study promotes collaboration among disciplines and services.

### Admission

To participate in the program the student should:

Be formally admitted to The University of Akron as a postbaccalaureate, graduate or non-degree graduate student.

Make written application to the program and receive written notification of admission from The Center for Family Studies.

### Requirements

#### Core:

Students must successfully complete all three of the core courses listed below. However, the first two courses plus three hours of electives must be completed prior to the student's enrollment in the practicum course.

7400.596	Parent Education	3
7400.605	Developmental Parent-Child Interactions	3
7400.593	Workshop: Practicum in Parent and Family Education	3

#### Electives:

Students must successfully complete six credits of coursework selected from among the various departmental courses listed below. These credits shall be chosen from departments outside the student's discipline.

##### • Home Economics and Family Ecology

7400.501	Family-Life Patterns in the Economically Deprived Home	2
7400.504	Adolescence in the Family Context	3
7400.540	Family Crisis	3
7400.546	Culture, Ethnicity and the Family	3
7400.602	Family in Life-Span Perspective	3
7400.607	Family Dynamics	3
7400.610	Child Development Theories	3
7400.651	Family and Consumer Law	3
7400.665	Development in Infancy and Early Childhood	3

##### • Social Work

7750.555	The Black Family	3
7750.685	Social Work Practice: Family and Children	3
7750.686	Social Welfare Policy and Services: Family and Children	3

##### • Nursing

8200.651	Child and Adolescent Health Nursing I	3
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##### • Psychology

3750.530	Psychological Disorders of Children	4
3750.726	Child Psychology	4
3750.737	Psychology of Learning Disabilities	4

##### • Sociology

3850.512	Socialization Child to Adult	3
3850.677	Family Analysis	3

##### • Educational Foundations

5100.648	Individual and Family Development Across the Lifespan	3
5100.721	Learning Processes	3

##### • Educational Guidance and Counseling

5600.646	Multicultural Counseling	3
5600.648	Individual and Family Development Across the Lifespan	3
5600.655	Marriage and Family Therapy: Theories and Techniques	3
5600.667	Marital Therapy	3
5600.669	Systems Theory in Family Therapy	3

##### • Special Education

5610.540	Developmental Characteristics of Exceptional Individuals	3
5610.559	Communication and Consultation with Parents and Professionals	3

##### • Multicultural Education

5630.582	Characteristics of Culturally Diverse Populations	3
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##### • Educational Administration

5700.604	School-Community Relations	3
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## PUBLIC POLICY

Stephen C. Brooks, Ph.D., *Chairman, Coordinating Committee*

### Program

This program will assist the person in understanding, formulating and implementing decisions in the public realm. A person who is interested in government service, administration of publicly supported institutions and the teaching of government at the college level should find such an interdisciplinary program to be of great value.

### Admission

Persons are eligible for admission to the Graduate Certificate in Public Policy Program if they have been admitted to graduate study as non-degree students in the departments of economics, political science or sociology, or are pursuing a master's or doctoral degree in one of those three departments. Students who are pursuing a graduate degree in other departments at the University may be admitted upon the recommendation of the chair of the department in which they are enrolled.

### Requirements

#### Core:

Each student enrolled in the program shall complete three of the following courses: one from the Department of Economics, one from the Department of Political Science and one from the Department of Sociology.

#### • Economics (choose one)

3250:530	Human Resource Policy	3
3250:606	Public Finance	3
3250:665	Seminar on Economic Planning	3

#### • Political Science (choose one)

3700:541	The Policy Process	3
3700:542	Methods of Policy Analysis	3
3700:668	Seminar in Public Policy Agendas and Decisions	3
3700:670	Seminar in the Administrative Process	3

#### • Sociology (choose one)

3850:613	Sociology of Program Evaluation and Program Improvement	3
3850:679	Political Sociology	3

In addition to the courses listed above, each student, after receiving the approval of his or her adviser, shall complete two courses related to public policy.

Each student shall complete a scholarly paper dealing with public policy under the direction of a graduate faculty member in the departments of economics, political science or sociology. The student shall enroll for three credits in one of the following courses: 3250:697/698 *Reading in Advanced Economics*, 3700:697 *Independent Research and Readings* or 3850:697 *Readings in Contemporary Sociological Literature*. The student's paper shall be evaluated by an interdisciplinary committee consisting of graduate faculty from at least two of the previously mentioned departments.

All persons enrolled in the Graduate Certificate Program in Public Policy must successfully complete 3700:695 *internship in Political Science*, a course which will permit a student to gain experience working with public officials, government agencies, political parties or interest groups. A student will normally enroll in this course after having completed at least 12 semester credits of work relating to public policy. A person with extensive administrative or governmental experience may be permitted, with the approval of the student's adviser, to substitute another course dealing with public policy in place of the Internship in Political Science.

At least two-thirds of the credits earned for this certificate must be in 600- or 700-level courses. No more than three courses in which the student enrolls, of the seven required for the Graduate Certificate in Public Policy, may also apply toward meeting requirements for a graduate degree at The University of Akron.

The student must maintain at least a "B" (3.00) average in course work for the certificate.

### Administration of the Program

The departments of economics, political science and sociology shall each annually select a representative for a coordinating committee from among those members of the graduate faculty who have special knowledge or expertise in the area of public policy. The committee shall each year elect one of its members as chairperson. The chairperson shall be responsible for disseminating information about the certificate, certifying that a student has met requirements for the completion of the program and convening members of the coordinating committee whenever appropriate.

## TEACHING ENGLISH AS A SECOND LANGUAGE†

Kenneth J. Pakenham, Ph.D., *Director*

### Requirements

This program is intended for those who seek training in the teaching of English as a second language (ESL) at the elementary or high school level or who wish to obtain an initial qualification in teaching ESL in order to teach in settings other than the Ohio public school system.

The program is designed to introduce the student to the central issues in the theory and practice of teaching English to non-native speakers through courses in modern and applied linguistics, in second language pedagogy and in related disciplines.

Students who do not have English as a native language must demonstrate adequate proficiency in English with a valid TOEFL score of at least 550.

### Program

3300:573	Seminar in Teaching ESL: Theory and Method	3
3300:589	Seminar in English: Grammatical Structures of English	2-3
5630:581	Multicultural Education in the U.S.**	3
	or	
3300:589	Seminar in English: Sociolinguistics**	2-3
5630:587	Techniques for Teaching ESL in the Bilingual Classroom	4

†The awarding of this certificate is not contingent upon completion of a degree program. Undergraduate certificate programs require a 2.00 grade-point average; graduate certificate programs require a 3.00 grade-point average.

\*\*Choice to be decided in consultation with the program director.

## TECHNICAL AND SKILLS TRAINING

Susan J. Olson, Ph.D., *Coordinator*

This certificate program in technical and skills training is a special course of study within the College of Education undergraduate and graduate programs to serve the practicing or prospective business and/or industrial-technical trainer.

Persons are eligible for admission to the Certificate in Technical and Skills Training if they have been admitted to study as special, non-degree or full-time students in any department of the University. Undergraduate students will earn the certificate upon graduation from their degree program. Individuals who already hold undergraduate or graduate degrees may also pursue this certificate. Students with an undergraduate degree who do not seek a graduate degree may pursue the certificate at the postbaccalaureate program. Students who already hold a graduate degree or do not wish to pursue a graduate degree may be admitted to the program as a non-degree graduate student. Students pursuing graduate degrees will receive their graduate certificate upon completion of the requirements for their graduate degree. Students enrolled in the undergraduate and post-baccalaureate program will enroll in the courses at the undergraduate level. Students admitted to the Graduate School as degree seeking or non-degree students will enroll in graduate courses. Graduate students enrolled in the core courses at the 500 level will have an additional graduate level project.

Those formally admitted to The University of Akron and meeting the Certificate entrance requirements may pursue the Certificate in Technical and Skills Training. Students shall seek admission to this program by filing an application with the program coordinator. The student will schedule courses with the assistance of an advisor in the Technical Education Program.

Those who have completed either a BS or MS in Technical Education at The University of Akron prior to the Fall of 1994 must seek advisor approval before pursuing the Certificate. Only six hours of prior technical education coursework can be accepted towards the certificate and all accepted coursework must be no older than six years at the time of completion of the certificate. Only graduate credit may be used for a graduate certificate and only undergraduate credit may be used for an undergraduate or postbaccalaureate certificate. Any course substitutions must be made with the advisor's prior written approval. Students must maintain at least a 3.0 average in certificate coursework to receive this certificate. Enrollment will be limited to space available. All those applying for the undergraduate certificate, must have completed at least 60 semester hours with a 2.75 GPA. For those applying for the graduate certificate, students must have a 2.75 GPA in their completed undergraduate degree. All coursework must be completed within six years.

## **Admission**

To participate in the program the student should:

- Be formally admitted to The University of Akron as an undergraduate, postbaccalaureate or graduate student.
- Make written application to the program coordinator.
- Receive written notification from the program coordinator.
- Consult with a Technical Education Program Advisor to formulate a program of study.

## **Requirements**

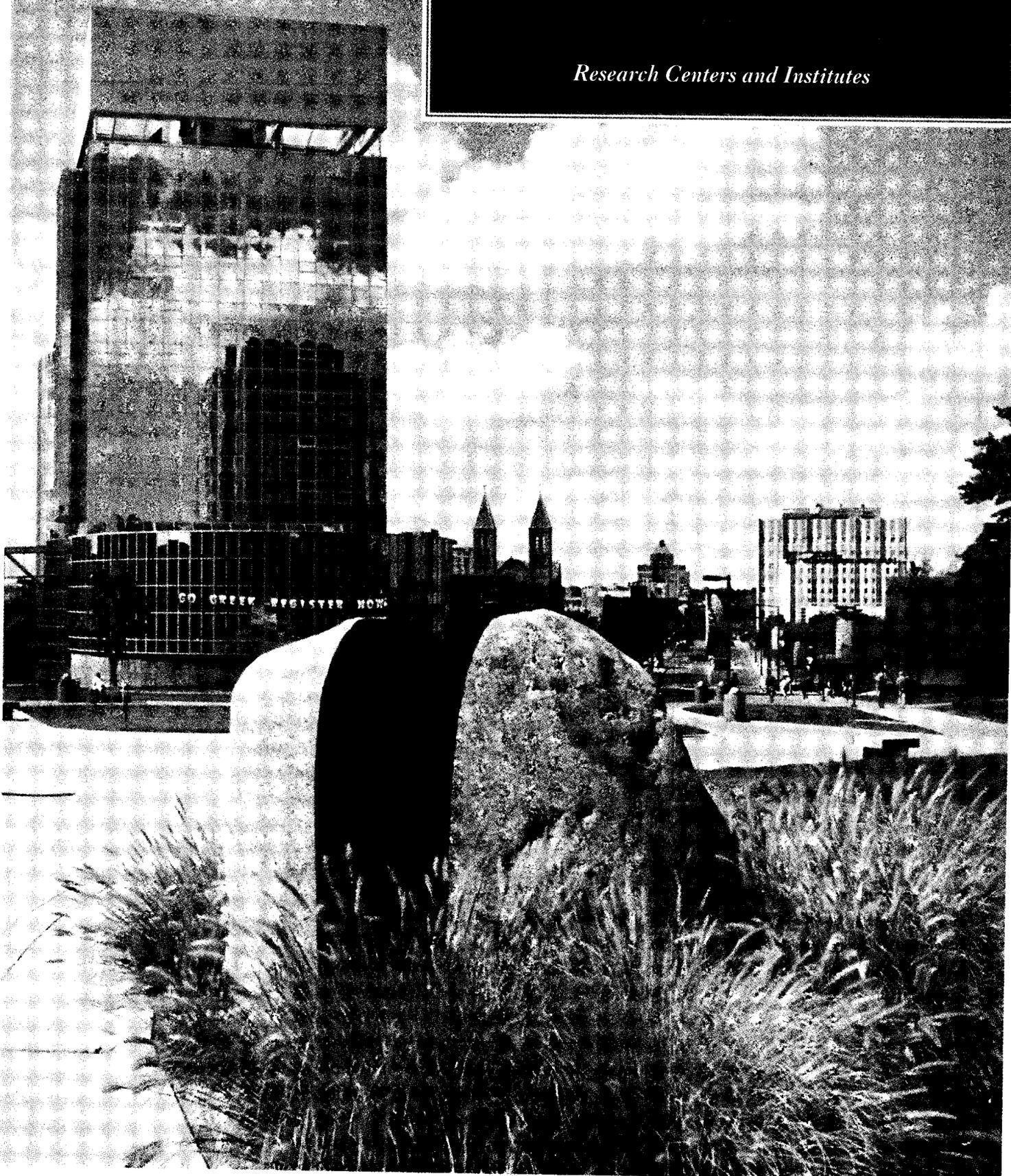
Minimum: 18 Credits

5400:500	The Postsecondary Learner	3
5400:515	Training in Business and Industry	3
5400:530	Systematic Curriculum Design for Technical Education	3
5400:535	Instructional Techniques in Technical Education	3
5400:690	Internship in Technical Education	3
5100:520	Introduction to Instructional Computing	3

The Internship is the last course taken. This course can not be taken until all other certificate courses have been completed with a 3.0 GPA or better.

# SECTION FIVE

*Research Centers and Institutes*



# Research Centers and Institutes

## University Research Council:

- C. S. Chen, Ph.D., *Interim Associate Vice President of Research and Technology Transfer* (interim chair)  
 Ted Mallo, J.D., *Vice President and General Counsel; Secretary, Board of Trustees*  
 Frank Kelley, Ph.D., *Dean, College of Polymer Science and Polymer Engineering*  
 Roger Creel, Ph.D., *Dean, Buchtel College of Arts and Sciences*  
 Charles Dye, Ph.D., *Dean, Graduate School*  
 Max Willis, Ph.D., *Associate Dean, Research and Graduate Studies, College of Engineering*  
 Virginia Gunn, Ph.D., *Professor, Home Economics and Family Ecology*  
 Larry Martin, Ph.D., *Associate Professor, English*  
 Gerald Parker, *Director, Research Services and Sponsored Programs* (secretary)  
 James White, Ph.D., *Director, Institute of Polymer Engineering*

The University Research Council is responsible for encouraging, supporting, and making recommendations pertaining to sponsored and contractual research carried out at the University's departments, centers, and institutes. The council consists of the Associate Vice President for Research and Technology Transfer, the Director of Research Services and Sponsored Programs, representatives of the Faculty Senate, various college deans and institute directors, and General Counsel. Sponsored research activities on campus are coordinated by the Interim Associate Vice President for Research and Technology Transfer and the Director of Research Services and Sponsored Programs.

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## Ray C. Bliss Institute of Applied Politics

John C. Green, Ph.D., *Director*

The Ray C. Bliss Institute of Applied Politics is a public education and research adjunct of The University of Akron and its Department of Political Science. The broad purposes of the institute, in keeping with the career of its namesake, Ray C. Bliss, are: to give all citizens, and particularly students, an opportunity to learn how to become active and competent in political life; to help maintain a tradition of ethical public service in politics; to foster useful relationships between applied politics and political science; to promote public comprehension of political organizations and the requirements for their effectiveness; and to improve understanding of continuity and change in American political institutions.

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## Institute for Biomedical Engineering Research

Stanley Rittgers, Ph.D., *Director*

This institute was established in 1979 to promote interdisciplinary studies in the rapidly growing areas of knowledge which overlap the fields of biology and medicine, on the one hand, and engineering and the physical sciences, on the other. It conducts seminars, courses and degree programs in biomedical engineering in association with the College of Engineering and individual departments.

In addition to its research and educational functions, the institute provides a research service to local hospitals and industry, as well as to private and government agencies. The premise for this program is that the combined resources of the University, Northeastern Ohio Universities College of Medicine and affiliated organizations will often permit more cost-effective solutions than would be possible by an individual or group doing the research independently.

The work of the institute is carried out by faculty of the Department of Biomedical Engineering in association with "members" selected from the faculties of The University of Akron and Northeastern Ohio Universities College of Medicine, as well as from the ranks of area physicians, engineers and scientists. The institute and the department occupy the third floor of the Olson Research Center on the north edge of the campus.

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## Center for Economic Education

Fred M. Carr, Ph.D., *Director*

The center exists to improve the economic literacy of individuals to help them function competently as citizens, producers and consumers.

The center conducts workshops, seminars and economic programs for teachers, students and interested groups. It provides consulting services in the area of economic education and acts as a clearinghouse for the gathering and dissemination of economic education materials and programs. It also fosters an understanding and appreciation of the American economic system.

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## Center for Environmental Studies

Annabelle M. Foos, Ph.D., *Interim Director*

The Center for Environmental Studies matches the expertise of 95 affiliates in 33 disciplines with the needs of students seeking study and research opportunities in complex environmental issues. Since its founding in 1970, the center has sponsored, or in other ways supported, activities appropriate to the goal of attaining a quality environment for mankind.

The center coordinates special forums, workshops and seminars that address major issues. Examples include the National Energy Forum, the World Food Forum, and Evaluation of Environmental Data. Workshops on energy, natural history and environmental studies in England also emphasize the interdisciplinary approach to the resolution of issues.

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## Center for Family Business

Susan C. Hanlon, D.B.A., *Director*

The Center for Family Business provides seminars, conferences and round table groups to help business owners address problems unique to family enterprises. The Center seeks to increase the survival rate of family-owned businesses by focusing attention on the special challenges inherent in multigenerational family enterprises.

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## Center for Family Studies

Helen K. Cleminshaw, Ph.D., *Director*

The Center for Family Studies, established in 1979, was designed to stimulate and encourage the interdisciplinary study of the family. It serves both the University and the community by fostering collaboration between faculty, students, practitioners and community leaders on curriculum development, educational conferences and seminars, research and training, and public policy relevant to important family issues.

The Center is represented by faculty from 5 colleges and over 15 disciplines. It also includes leaders from various community systems, such as the schools, hospitals, courts, churches, mental health, social and health care agencies. In addition, the Center has a fellows program in which outstanding faculty and community leaders are named as either fellows, adjunct fellows or senior fellows.

The Center offers certificates in the following specialty areas: Divorce Mediation and Home-Based Intervention. Please refer to the sections on Certificate Programs in this *Bulletin* or the *General Bulletin* for further information.

Any student, faculty member or community person interested in family issues is invited to call the director to learn how they can participate or learn more about the Center's activities.

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## Training Center for Fire and Hazardous Materials

David H. Hoover, Ph.D., *Director*

The Training Center for Fire and Hazardous Materials brings the University, government and industry together into one comprehensive regional center to integrate educational programs, fire and hazardous materials training and other applications of fire and safety technology. The center coordinates seminars and workshops presented by the Federal Emergency Management Agency (FEMA), the Division of State Fire Marshal and other related organizations. Training in all phases of hazardous materials containment and fire prevention and control is provided under contract to various municipalities, industries and agencies. The programs are supported by the faculty of the Fire Protection Technology degree program in association with other state and nationally recognized professionals.

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## Fisher Institute for Professional Selling

Jon M. Hawes, Ph.D., *Director*  
James T. Strong, Ph.D., *Associate Director*

The Fisher Institute for Professional Selling was founded in 1993. Its mission is to enhance the image of the sales profession, to promote professional selling and sales management as a rewarding lifetime career, to provide quality sales training and learning experiences, and to advance the knowledge of professional selling through the support of applied research.

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## William and Rita Fitzgerald Institute for Entrepreneurial Studies

James E. Inman, LL.M., *Director*

In 1995, a generous gift from William and Rita Fitzgerald created the Fitzgerald Institute for Entrepreneurial Studies in the College of Business Administration. The Institute was established to promote the principles of free enterprise and encourage entrepreneurial spirit and practices both within the University's curriculum and throughout the business community.

The Fitzgerald Institute focuses on the development of curriculum appropriate for both new ventures and the entrepreneurial development and growth of existing businesses. The Institute provides the needed link between the University and the community of entrepreneurs critical to business development in the future. The Fitzgerald Institute also sponsors several outreach projects, such as the Center for Family Business, The Center for Small Business, and Students in Free Enterprise.

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## Institute for Futures Studies

Gary Gappert, Ph.D., *Director*

The Institute for Futures Studies and Research exists to initiate and provide comprehensive programs in salient and vital policy research, including a structural framework which encompasses strategic planning, environmental scanning, trends analysis and other innovative research methods.

The Institute for Future Studies and Research was established in 1978, with its focus on interdisciplinary courses, lectures, publications, and activities relating to relevant issues which will impact the future of the local, state, national, and international arenas. It cooperates with the Center for Urban Studies and other research institutes.

Through its relationship with the Department of Public Administration and Urban Studies and The Center for Urban Studies, the Institute has organized and produced several books relating to the urban future including the 1990 publication, *Cities in a Global Society* and the forthcoming *The Future of Urban Environments*. It has also sponsored major conferences on George Orwell, Aldous Huxley, and Edward Bellamy in cooperation with the Ohio Humanities Council.

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## Center for Global Business

James W. Barnett, B.B.A., *Director*

The University of Akron received special funding from the State of Ohio to expand its offerings of undergraduate and graduate degree programming in international business. Thus, the College of Business Administration created the Institute for Global Business, which coordinates both credit and noncredit programming in international business. The Institute also develops short courses and seminars designed to help improve the international competitiveness of area business.

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## Institute for Life-Span Development and Gerontology

Harvey L. Sterns, Ph.D., *Director*  
Isadore Newman, Ph.D., *Associate Director*  
Becky Snyder Warner, M.A., *Program Coordinator,*  
*Gerontology Certificate Program*  
Terry H. Albanese, Ph.D., *Practicum Coordinator*  
Jerome Kaplan, Ph.D., *Program Coordinator,*  
*Nursing Home Administrator Program*

The Institute for Life-Span Development and Gerontology, founded in 1976, coordinates multidisciplinary credit certificate programs in gerontology at the undergraduate and graduate levels. In addition, this certificate is included in the Ohio Board of Examiners of Nursing Home Administrators approved course of study in Nursing Home Administration which combines a Bachelor of Science degree in Industrial Management (Personnel Option) with a Certificate in Gerontology.

Faculty fellows at the institute representing 23 University departments conduct research, and provide special courses, workshops, and seminars as well as participate in community research and demonstration projects. Students in the certificate programs carry out field placements at numerous community service settings.

Examples of outreach activities include the Elderhostel program, offered each summer for older adults who participate in a week-long residential learning experience.

The institute is a member of the Northeastern Ohio Consortium on Geriatric Medicine and Gerontology, joining together with the Office of Geriatric Medicine and Gerontology, Northeastern Ohio Universities College of Medicines; Gerontology Center, Kent State University; and Gerontology Committee, Youngstown State University.

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## Center for Nursing

Elizabeth Kinion, Ed.D., R.N., *Director*

The Center for Nursing is a part of The University of Akron's College of Nursing. It is an education and practice center for College of Nursing faculty and students as well as faculty and students from other health care disciplines on campus.

Since 1981 the Center for Nursing has provided wellness services to campus students, faculty and staff as well as outreach services to community residents of all ages. Services include health assessments and nursing physicals, stress management and self-care assistance, family and group education and support sessions. Community outreach to vulnerable populations is a major emphasis of the center.

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## Center for Peace Studies

For information, contact the office, 201 Leigh Hall, (330) 972-6513.

The Center for Peace Studies provides students with the opportunity for an interdisciplinary program of study in one of the related fields of international peace or conflict resolution and management. Course programs draw on the resources of a wide spectrum of the University's academic departments. Upon completion of all selected courses, students receive not only academic credits for the courses but a Certificate in Peace Studies or a Certificate in Conflict Resolution/Management, respectively. The Center also sponsors workshops for teachers, special campus programs, and research projects. It also collaborates with community organizations and peace centers on other campuses.

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## Institute for Policy Studies

Jesse F. Marquette, Ph.D., *Director*  
AnneMarie Scarisbrick-Hausser, Ph.D., *Associate Director*  
Richard W. Stratton, Ph.D., *Interim Associate Director*

The Institute for Policy Studies houses a number of programs, located in two units, the Urban and Policy Research Division and Institutional Research.

The Urban and Policy Research Division houses the University of Akron Survey Research Center with responsibility for external grant and contract research, research support for the Urban University Linkage Program, sponsored research for faculty, and internal University surveys. The research facility is equipped to facilitate telephone interviewing, mail surveys, focus group administration, intercept studies and personal interviews, database analysis, and computer assisted data entry and multiple method studies. Most of the work conducted at the Urban and Policy Research Division is on behalf of government or non-profit agencies. Institutional professional staff are available for consultation in the development of grant proposals and budgets.

The Urban and Policy Research Division (URPD) also has responsibility for the administration of the Ohio Board of Regent's Urban University Program (UUP) which links eight state universities to collaborate on the identification of urban problems and propose solutions designed to improve urban regions in Ohio. The University of Akron Urban University Program, in addition to the collaborative mission of the Ohio UUP, coordinates community oriented research and policy analysis. The URPD also houses an Ohio State Data center and coordinates GIS activities with the Department of Geography and Planning.

The Institutional Research Division has responsibility for research and analysis of University operations and assessment. The Institutional Research Division mission is to ensure the timely submission of all appropriate Ohio Board of Regents reports and to coordinate the development and maintenance of the appropriate data structures for the continuing analysis of university operations and assessment. The Institutional Research Division also maintains a regularly updated web site of institutional information.

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## **Institute of Polymer Engineering**

James L. White, Ph.D., *Director*

The Institute of Polymer Engineering carries out fundamental and applied research in polymer processing, engineering performance and associated characterizations.

The institute, founded in 1983, seeks to be a major intellectual and research resource in northeast Ohio. The institute maintains up-to-date and futuristic processing and characterization laboratories, with continued interest in development investigation of new process technology and new materials. Its activities also include organization of scientific symposia and various seminars related to polymer processing and engineering.

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## **The Maurice Morton Institute of Polymer Science**

Frank Harris, Ph.D., *Director*

The institute is concerned with basic and applied research in polymers. It was established in 1956 as the Institute of Rubber Research and in 1964 became the interdisciplinary Institute of Polymer Science. The University's first Ph.D. program in polymer chemistry was started in 1956 and was administered by the institute until a separate Department of Polymer Science was established in 1967. The institute maintains extensive laboratory facilities, an applied research group, a macromolecular modeling center, and a mini pilot plant for polymer synthesis. It is the principal organization responsible for external funding of research projects and graduate fellowships in polymer science.

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## **Microscale Physiochemical Engineering Center (MPEC)**

George G. Chase, Ph.D., *Director*

The Microscale Physiochemical Engineering Center (MPEC) was established in 1996 by faculty with a common research interest in materials composed of very small particles. These small particles occur, for example, in heterogeneous catalysts, fluid/solid separations, paper-pulp processing, soil remediation, waste water decontamination, and solid transport.

The unique feature of MPEC is the ability to form multi-disciplinary teams of faculty and graduate students to solve specific industrial problems.

The Center hosts an annual conference, promotes networking, provides a forum for industrial-university cooperation, and is a consortium of industrial sponsors for fundamental and applied research in microscale physiochemical engineering.

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## **Process Research Center (PRC)**

Sunggyu Lee, Ph.D., *Director*

Kathy L. Fullerton, Ph.D., *Assistant Director*

The Process Research Center (PRC), founded in 1990, focuses on fundamental and applied research involving new chemical processes and novel materials.

The specialties of the PRC include chemical reactions, separation technology, new polymeric materials, biotechnology, and environmental engineering. In conjunction with this, the Center operates several scale-up and minipilot plant facilities.

The PRC aims at responding more positively to the needs of industries enhancing cooperation between the University and industries. Great opportunities are available for both graduate and undergraduate students to conduct practical research.

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## **Center for Small Business**

Jeffrey C. Dilts, Ph.D., *Director*

Established in 1973, the Center for Small Business (formerly the Small Business Institute) offers full management assistance counseling to area businesses through the utilization of senior students, working as advisers under the supervision of the College of Business Administration faculty. Over 350 firms have been serviced by the Center since its founding.

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## **Center for Urban Studies**

Nancy K. Grant, Ph.D., *Director*

The Center for Urban Studies (CUS) is The University of Akron's oldest policy research and professional service unit. Established in 1965, the Center acts as a bridge between the University and the Akron community, Ohio and beyond in pursuit of the University's urban mission. To meet the needs of urban communities the Center engages in a wide variety of scholarly and applied research projects, research consultation, and information and data services.

Using the talents of faculty, researchers, support staff, and students, the Center explores important economic, social, and political issues; works with others to reach a better understanding of these issues; and assists groups and organizations actively engaged in problem solving, coalition building, or strategic planning.

This multidisciplinary approach encourages faculty and graduate student participation from all departments with an urban focus. A part of the Buchtel College of Arts and Sciences, the Center for Urban Studies provides the setting and facilities through which interested faculty and graduate students do become involved in urban research or professional service activities in the urban community. For many graduate students, experience gained in the Center for Urban Studies becomes an important complement to formal classroom training in their career participation.

# SECTION SIX

*Courses of Instruction*



# Course Numbering System\*

## INDEX

### Interdisciplinary Programs

- 1800 Divorce Mediation  
1820 Home-Based Intervention Therapy  
1880 Medical Studies

### Buchtel College of Arts and Sciences

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|--|---|
| 3001 Women's Studies                                       | 3460 Computer Science                           |
| 3006 Institute for Lifespan<br>Development and Gerontology | 3470 Statistics                                 |
| 3010 Environmental Studies                                 | 3490 Engineering Applied<br>Mathematics         |
| 3100 Biology   | 3500 Modern Languages                           |
| 3110 Biology/NEOUCOM                                       | 3520 French                                     |
| 3150 Chemistry   | 3530 German                                     |
| 3200 Classics  | 3580 Spanish                                    |
| 3210 Greek   | 3600 Philosophy                                 |
| 3220 Latin   | 3650 Physics                                    |
| 3250 Economics   | 3700 Political Science                          |
| 3300 English   | 3750 Psychology                                 |
| 3350 Geography and Planning                                | 3850 Sociology                                  |
| 3370 Geology   | 3870 Anthropology                               |
| 3400 History   | 3980 Public Administration and<br>Urban Studies |
| 3450 Mathematics   |   |

### College of Engineering

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|-----------------------------|-----------------------------|
| 4200 Chemical Engineering   | 4450 Computer Engineering   |
| 4300 Civil Engineering      | 4600 Mechanical Engineering |
| 4400 Electrical Engineering | 4800 Biomedical Engineering |

### College of Education

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| 5100 Educational Foundations<br>and Leadership | 5560 Outdoor Education                   |
| 5190 Higher Education Administration           | 5570 Health Education                    |
| 5200 Elementary Education                      | 5600 Educational Guidance                |
| 5250 Reading                                   | 5610 Special Education and<br>Counseling |
| 5300 Secondary Education                       | 5620 School Psychology                   |
| 5400 Technical and<br>Vocational Education     | 5630 Multicultural Education             |
| 5550 Physical Education                        | 5700 Educational Administration          |
|  | 5800 Special Educational Programs        |

### College of Business Administration

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|------------------|-----------------------------|
| 6200 Accountancy | 6600 Marketing              |
| 6400 Finance     | 6700 Professional           |
| 6500 Management  | 6800 International Business |

### College of Fine and Applied Arts

- |   |   |
|---|---|
| 7100 Art                                  | 7700 Speech-Language Pathology<br>and Audiology |
| 7400 Home Economics and<br>Family Ecology | 7750 Social Work                                |
| 7500 Music                                | 7800 Theatre                                    |
| 7510 Musical Organizations                | 7810 Theatre Organizations                      |
| 7520 Applied Music                        | 7900 Dance                                      |
| 7600 Communication                        | 7910 Dance Organizations                        |
|   | 7920 Dance Performance                          |

### College of Nursing

- 8200 Nursing

### College of Polymer Science and Polymer Engineering

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|--------------------------|----------------------|
| 9841 Polymer Engineering | 9871 Polymer Science |
|--------------------------|----------------------|

\* A more detailed explanation of the numbering system can be found in **Section Two**, "Course Numbering System," in this *Bulletin*.

# Interdisciplinary Programs

## DIVORCE MEDIATION

### 1800:

- 601 DIVORCE MEDIATION** *3 credits*  
Prerequisite: Admission to the Graduate Certificate Program on Divorce Mediation. Overview of divorce mediation process includes guidelines for negotiating separation and divorce agreements, division of personal and real property, support, custody, and future plans.
- 602 DIVORCE MEDIATION PRACTICUM** *2 credits*  
Prerequisite: 601. Practical application of divorce mediation procedures. Review of strategies and ethical considerations.

## HOME-BASED INTERVENTION THERAPY

### 1820:

- 503 HOME-BASED INTERVENTION THEORY** *3 credits*  
Prerequisite: Admission to Certificate Program. Overview of home-based intervention to include philosophy and description of this programming as well as assessment of family, their home and community environment.
- 504 HOME-BASED INTERVENTION TECHNIQUES AND PRACTICE** *3 credits*  
Prerequisite: 503. Provides intervention techniques and skill areas required for home-based intervention and learning opportunities for matching techniques with specific family problems.
- 505 HOME-BASED INTERVENTION INTERNSHIP** *3-5 credits*  
Prerequisite: 504. Gives students the opportunity to apply knowledge of home-based intervention in actual delivery process working with families in their homes under the direct supervision of trained, experienced home-based intervention therapists.

## MEDICAL STUDIES

### 1880:

- 501 SPECIAL TOPICS: MEDICAL EDUCATION** *1-3 credits*  
(May be repeated with a change of topic with a maximum of three credits toward graduation.) Prerequisites: upper-college student status and permission. Selected topics on medical education offered by professionals. Intended to provide advanced undergraduate education and continuing education for student and practitioners in the health services. Graded CR/NCR.

## WOMEN'S STUDIES

### 3001:

- 580 FEMINIST THEORY** *3 credits*  
Prerequisite: 3001/300. A summary of feminist theory to familiarize students with the main currents in contemporary feminist theory and the origins and evolution of that thought.
- 585 SPECIAL TOPICS IN WOMEN'S STUDIES** *1-3 credits*  
(May be repeated). Specialized topics and current issues in Women's Studies. Covers content and issues not currently addressed in other academic courses. Emphases will be on original source materials, critical analyses and the synthesis of empirical and theoretical aspects.
- 590 WORKSHOP** *1-3 credits*  
(May be repeated). Group experiential study of special issues in Women's Studies.

## INSTITUTE FOR LIFE-SPAN DEVELOPMENT AND GERONTOLOGY

### 3006:

- 680 INTERDISCIPLINARY SEMINAR IN LIFE-SPAN DEVELOPMENT AND GERONTOLOGY** *3 credits*  
Prerequisite: permission. The certificate program student only. Explores interdisciplinary issues in life-span development and gerontology. Guest speakers from various disciplines and services which have life-span development and gerontological components and from government and community facilities and services.
- 685 SPECIAL TOPICS** *1-3 credits*  
Prerequisite: permission of instructor. Specialized topics and current issues in life-span development, gerontology, or gender. Emphasis is on original source materials, critical analyses and syntheses of empirical, theoretical and applied aspects.
- 686 RETIREMENT SPECIALIST** *2 credits*  
An investigation of issues related to the design and implementation of pre-retirement planning and examination of life-span planning education as employed by labor, business and education.

- 690 WORKSHOP** *1-3 credits*  
(May be repeated) Group studies of special topics in life-span development and gerontology. May be used as elective credit but not as part of certificate required courses.

- 695 PRACTICUM IN LIFE-SPAN DEVELOPMENT AND GERONTOLOGY** *3 credits*  
Prerequisite: permission. Supervised experience in research or community agency work.

## ENVIRONMENTAL STUDIES

### 3010:

- 590 WORKSHOP IN ENVIRONMENTAL STUDIES** *1-4 credits*  
Prerequisite: varies with topic. Credit in graduate program must have prior approval of adviser. Skills, attitudes and fundamental concepts dealing with timely environmental problems and issues covered. Instruction under direction of University faculty.
- 602 EVALUATION OF ENVIRONMENTAL DATA** *3 credits*  
Prerequisites: graduate standing, one year of chemistry, physics, job experience or course work in chemical engineering. A review of environmental testing techniques in current use; emphasis on interpretation and limitations.
- 661 GRADUATE SEMINAR IN ENVIRONMENTAL STUDIES** *3 credits*  
Prerequisite: graduate standing. Explores topics of current environmental concerns. Emphasis on presentation of oral and written reports and subsequent student-faculty dialogue.

# Buchtel College of Arts and Sciences

## BIOLOGY

### 3100:

- 500 FOOD PLANTS** *2 credits*  
Prerequisite: 311 or permission of instructor. A survey of the plants used for human food, including their history, structure, uses.
- 521 TROPICAL FIELD BIOLOGY** *4 credits*  
Prerequisite: 111/112 or equivalent. Ecology of coral reefs, tide pools, mangroves, intertidal zones, terrestrial flora and fauna, island biogeography. Taught at a field station in the tropics.
- 522 CONSERVATION OF BIOLOGICAL RESOURCES\*** *4 credits*  
Prerequisite: 217 or permission. Basic principles for management of plant and animal resources and natural areas. Political, economic and social aspects of resource management. Laboratory with field trips.
- 524 FRESHWATER ECOLOGY\*** *3 credits*  
Prerequisite: 217 Field, laboratory study of lake ecosystems. Species composition of selected biotic communities, community energetics, nutrient cycling. Limnological survey of a local lake. Laboratory.
- 525 FRESHWATER ECOLOGY FIELD AND LABORATORY STUDIES** *3 credits*  
Prerequisite: 217 or permission of instructor. Field and laboratory studies of local lakes, ponds, and reservoirs. Collection, identification, and ecology of aquatic plants and animals, especially phytoplankton, zooplankton and benthic organisms.
- 526 APPLIED AQUATIC ECOLOGY\*** *4 credits*  
Prerequisite: permission. Biological methods for assessing quality of natural waterways. Emphasis given to use of benthic invertebrates as indices of water quality. Laboratory.
- 528 BIOLOGY OF BEHAVIOR** *2 credits*  
Prerequisites: 211, 217 and 316. Biological basis of behavior: ethological theory; function, causation, evolution and adaptiveness of behavior. May be taken without 429/529.
- 529 BIOLOGY OF BEHAVIOR LABORATORY** *2 credits*  
Prerequisites or corequisites: 428/528 and permission of instructor. Individualized, directed study to provide the student with firsthand experience in observing, describing and interpreting animal behavior.
- 532 ADVANCED GENERAL BACTERIOLOGY** *4 credits*  
Prerequisite: 331. Study of the groups of bacteria involved in the production of food or chemicals, those found in soil and water and those involved in microbial biogeochemical cycles. Laboratory.
- 533 PATHOGENIC BACTERIOLOGY** *4 credits*  
Prerequisite: 331. Study of major groups of bacteria which produce infections in humans. Biochemical properties of microorganisms which engender virulence and nature of host resistance. Laboratory.
- 535 VIROLOGY** *4 credits*  
Prerequisite: 331. Physical, chemical and biological properties of viruses including mechanisms of infection, genetics and tumor formation; methods of cultivation and identification. Laboratory.
- 537 IMMUNOLOGY** *4 credits*  
Prerequisite: 331; recommended: 433. Nature of antigens, antibody response and antigen-antibody reactions. Site and mechanism of antibody formations, hypersensitivity, immunologic tolerance and immune diseases considered. Laboratory.
- 540 MYCOLOGY** *4 credits*  
Prerequisite: 112. Structure, life history, classification of representative fungi with emphasis on the importance of fungi to humans. Laboratory.
- 541 PLANT DEVELOPMENT** *4 credits*  
Prerequisite: 112 and one year of organic chemistry. Embryology and morphogenesis of plants in relation to physical, chemical, genetic and spatial factors. Laboratory.
- 542 PLANT ANATOMY** *3 credits*  
Prerequisite: 112. Structure and development of cells, tissues, organs and organ systems of seed plants. Laboratory.
- 543 PHYCOLOGY** *4 credits*  
Prerequisite: 112. Examination of the major groups of algae with emphasis on life histories and their relationship to algal form and structure. Laboratory.
- 545 PLANT MORPHOLOGY\*** *4 credits*  
Prerequisite: 112. Structure, reproduction, life cycles, ecology, evolution, economic significance of land plants: bryophytes, club-mosses, whisk ferns, horsetails, ferns, seed plants. Laboratory.
- 547 PLANT PHYSIOLOGY** *3 credits*  
Prerequisite: 112 and one year of organic chemistry. Water, soil and mineral requirements of plants, and their metabolism, growth and response to internal and external stimuli. Laboratory.
- 548 ECONOMIC BOTANY** *2 credits*  
Prerequisite: 111/112 or instructor's permission. A survey of economically important plants and plant products, excluding food plants. Includes wood and fiber, dyes, drugs, resins, latex and other extractives.
- 551 GENERAL ENTOMOLOGY** *4 credits*  
Prerequisite: 112, 217. Structure, physiology, life cycles, economic importance characteristics of orders and major families of insects. Laboratories parallel lectures.
- 553 INVERTEBRATE ZOOLOGY** *4 credits*  
Prerequisites: 112, 217. Invertebrate groups, their classification, functional morphology, adaptive radiation and life history. A phylogenetic approach is used. Laboratories parallel lectures.
- 554 PARASITOLOGY** *4 credits*  
Prerequisites: 112, 3150.201. Principles of parasitism; host parasite interactions; important human and veterinary parasitic diseases; and control measures. Laboratories parallel lectures.
- 556 ORNITHOLOGY\*** *4 credits*  
Prerequisite: 112. Introduction to biology of birds: classification, anatomy, physiology, behavior, ecology, evolution, natural history and field identification. Laboratory.
- 558 VERTEBRATE ZOOLOGY** *4 credits*  
Prerequisite: 316 or permission. Biology of vertebrates, except birds – evolution, ecology, behavior, systematics and anatomy. Laboratory with field trips.
- 561,2 HUMAN PHYSIOLOGY** *4 credits each*  
Prerequisite: senior or graduate standing. Detailed study of function of the human body with special emphasis on neuromuscular, cardiovascular, respiratory, renal and endocrine physiology. Laboratory.
- 564 GENERAL AND COMPARATIVE PHYSIOLOGY** *4 credits*  
Prerequisites: 112 and one year of organic chemistry. Study of cellular, osmoregulatory, respiratory, cardiovascular, endocrine and neural mechanisms involved in understanding physiology of a variety of invertebrate and vertebrate animals. Laboratory.
- 565 ADVANCED CARDIOVASCULAR PHYSIOLOGY** *3 credits*  
Prerequisite: 462 or 562 or permission. Study of biological mechanisms involved in heart attack, strokes, fluid balance, hypertension and heart disease. Controversial issues in each area will be examined and current research presented.
- 566 VERTEBRATE EMBRYOLOGY** *4 credits*  
Prerequisite: 112 or permission of instructor. Designed to introduce the process of vertebrate development. Lecture and lab work include descriptive and experimental embryology.
- 567 COMPARATIVE VERTEBRATE MORPHOLOGY** *4 credits*  
Prerequisite: 112 or permission of instructor. An introduction to the comparative morphology of major vertebrates. The laboratory consists of dissections of representative vertebrates.
- 568 THE PHYSIOLOGY OF REPRODUCTION** *3 credits*  
Prerequisites: 462/562 or 464/564 or permission. Study of the physiological mechanisms of reproduction throughout the animal kingdom with special emphasis upon mammalian endocrinological control. Controversial issues in the field will be examined and current research presented.
- 569 RESPIRATORY PHYSIOLOGY** *3 credits*  
Prerequisites: 462/562 or 464/564 or permission. Study of mechanisms determining gas exchange including mechanics, ventilation, blood flow, diffusion, and control systems. Emphasis is given to normal human lung function. (Clinical aspects are not considered in detail.)
- 580 MOLECULAR BIOLOGY** *3 credits*  
Prerequisites: 211, 311. Fundamentals of molecular biology, including recombinant DNA technology, applications in biotechnology, medicine, and genetic engineering. Mechanisms of gene regulation.
- 581 ADVANCED GENETICS** *3 credits*  
Prerequisite: 211. Nature of the gene; genetic codes; hereditary determinants; mutagenesis and genes in population. Lecture and seminar.
- 584 PHARMACOLOGY** *3 credits*  
Prerequisite: 311; recommended: college-level physiology. Interactions of drugs and living systems with emphasis on molecular and cellular mechanisms of action, drug metabolism and excretion, and selected aspects of environmental toxicology. Clinical aspects and specific drug therapies not considered in detail.
- 594 WORKSHOP IN BIOLOGY** *1-3 credits*  
(May be repeated) Prerequisite: permission of instructor. Group studies of special topics in biology. May not be used to meet undergraduate or graduate major requirements in biology. May be used for elective credit only.
- 597,8 BIOLOGICAL PROBLEMS** *1-2 credits each*  
Prerequisite: permission. Honors-level work, usually consisting of laboratory investigations. A maximum of 4 credits may apply toward the major degree requirements.
- 625 BASIC DNA TECHNIQUES** *3 credits*  
Basic DNA techniques including extraction of DNA, cleavage of DNA and cloning. Laboratory.
- 660 ENVIRONMENTAL PHYSIOLOGY** *3 credits*  
Prerequisites: 561, 562. Study of physiological reactions of healthy mammals to natural changes or extremes of physical environment.
- 670 MEDICAL PHYSIOLOGY, PATHOPHYSIOLOGY, AND PHARMACOLOGY** *3 credits*  
Prerequisite: Admission to M.S.N. program, or 3100/561, or consent of instructor. Selected principles of human physiology, pathophysiology, and pharmacology are examined in depth, interrogated, and related to the care of patients in the clinical setting.
- 681 CYTOLOGY** *3 credits*  
Prerequisite: 311. Structure and functional organization of cells at ultrastructural level. Three lecture hours a week.
- 682 EUKARYOTIC TECHNIQUES-DNA** *3 credits*  
A graduate level laboratory course which familiarizes the student with several methods used to isolate and characterize eucaryotic genes at the DNA level.
- 684 EUKARYOTIC TECHNIQUES-RNA** *3 credits*  
A graduate level laboratory course which familiarizes the student with several methods used to study eucaryotic genes at the RNA level.
- 685 ANIMAL CELL CULTURE** *4 credits*  
Tissue culture techniques; biology and physiology of animal cells and tissues under *in vitro* conditions; application of these techniques to radiobiology, cancer chemotherapy and animal cell genetics. Laboratory.
- 686,7 RESEARCH IN THE BIOLOGY OF AGING** *3 credits each*  
Sequential. Prerequisite: graduate standing in biology, or by approval in related fields. Introduction to research techniques in study of biological aspects of aging and experience in special research project in the field.
- 688 PRINCIPLES OF TRANSMISSION ELECTRON MICROSCOPY** *3 credits*  
Prerequisite: 311 or 681 or equivalent. Modern cytological methods using transmission electron microscope. Portfolio required to demonstrate proficiency in fixation techniques, use of ultramicrotome, light and electron microscopes and darkroom techniques.
- 689 PRINCIPLES OF SCANNING ELECTRON MICROSCOPY** *3 credits*  
Prerequisites: 311, 681 or equivalent. An introduction of modern cytological methods using the scanning electron microscope. A portfolio is required to demonstrate proficiency in fixation techniques, the use of supplemental equipment such as the critical point drying apparatus and the sputter-coating apparatus and the efficient use of the scanning electron microscope.
- 695 SPECIAL TOPICS: BIOLOGY** *1-3 credits*  
(May be repeated) Prerequisite: permission. Special courses offered once or only occasionally in areas where no formal course exists.
- 697,8 BIOLOGY COLLOQUIUM** *1 credit each*  
(May be repeated) Prerequisite: permission. Attendance at all departmental seminars and presentation of seminar based on original research. Required of all thesis option students who shall present their thesis research.
- 699 MASTER'S THESIS** *1-6 credits*  
(May be repeated) A minimum of six credits is required for thesis option student.

\*Field trips involved; minor transportation costs.

**BIOLOGY/NEOUCOM****3110:**

- 620 MICROSCOPIC ANATOMY** 5 credits  
Prerequisites: graduate standing, permission and cell biology; histology suggested. Morphological basis for normal and disturbed functions; structure-function relationships in human microscopic anatomy. Lectures, special laboratory, learning techniques using human tissues.
- 630 HUMAN GROSS ANATOMY I** 3 credits  
Prerequisites: graduate standing and permission. An intensive survey of human macro-morphology.
- 631 HUMAN GROSS ANATOMY II** 3 credits  
Prerequisite: graduate standing and permission. An intensive survey of human macro-morphology.
- 641 FUNCTIONAL NEUROANATOMY** 6 credits  
Prerequisite: permission or graduate standing. Study of structure and function of mammalian nervous system with emphasis on human brain and human behavior. Laboratory.
- 643 NEUROPHYSIOLOGY** 3 credits  
Prerequisite: 641. The relation of aspects of the neurosciences to the fundamental properties of nervous tissue, establishing a firm base in experimental neurobiology. Laboratory.
- 695 SPECIAL TOPICS: BIOLOGY/NEOUCOM** 1-6 credits  
Prerequisite: permission of instructor. Advanced topics in medical education covering areas not otherwise available. May be repeated with a change in topic.

**CHEMISTRY****3150:**

- 501 BIOCHEMISTRY LECTURE I** 3 credits  
Prerequisite: 264. Biochemistry of amino acids, carbohydrates, lipids, and nucleic acids: structure/function relations. Enzymes as catalysts: kinetics and regulation. Cofactors.
- 502 BIOCHEMISTRY LECTURE II** 3 credits  
Prerequisite: 401/501. Overview of metabolism; thermodynamics; carbohydrate, fatty acid, amino acid, and nucleoside anabolism and catabolism; hormonal control of metabolism. Photosynthesis.
- 572 ADVANCED INORGANIC CHEMISTRY** 3 credits  
Prerequisite: 304 or 314. Concepts of atomic structure integrated in systematic classification of elements. Periodic table. Chemistry of the representative elements. Transition elements including coordination compounds, organometallics and metal carbonyls.
- 590 WORKSHOP IN CHEMISTRY** 1-3 credits  
(May be repeated) Group studies of special topics in chemistry. May not be used to meet undergraduate or graduate major requirements in chemistry.
- 601,2 CHEMISTRY OF POLYMERS I, II** 2 credits each  
Sequential. Prerequisites: 264 and 266 or permission of instructor. History, classification and nomenclature; natural polymers. Types and methods of polymerization. Ring vs. chain stability. Natural and synthetic polypeptides, nucleic acids.
- 603 BIOCHEMISTRY LECTURE III** 3 credits  
Prerequisite: 501 and 502. DNA, RNA and protein metabolism. Translation and transcription. Gene function and expression.
- 604,5 CHEMISTRY OF POLYMERS LABORATORY I, II** 2 credits each  
Sequential. Prerequisites: 264, 266. Preparation, identification of polymers to illustrate polymerization methods in 601, 602, 649.
- 610 BASIC QUANTUM CHEMISTRY** 3 credits  
Prerequisite: 314 or permission of instructor. Quantum mechanics with applications to molecular systems. Includes angular momentum, molecular hamiltonians, variation and perturbation methods and molecular orbital theories.
- 611 SPECTROSCOPY** 3 credits  
Prerequisite: 610 or permission of instructor. Interaction of light with matter, linear and nonlinear spectroscopies. Rotational, vibrational and electronic spectroscopy. Radiationless transitions and photochemistry.
- 619 TRANSITION-METAL ORGANOMETALLICS** 3 credits  
Prerequisite: 472 or equivalent. The organometallic chemistry of the transition metal elements. Topics covered include synthesis, characterization methods, structure, bonding, reactivity, and application.
- 620 MAIN GROUP ORGANOMETALLICS** 3 credits  
Prerequisite: 501 or equivalent. The organometallic chemistry of main group elements. Topics covered include synthesis, characterization methods, structure, bonding, reactivity, and applications.
- 621 ADVANCED PREPARATIONS** 1-2 credits  
Prerequisite: permission. Methods for preparing and purifying organic and inorganic compounds. Laboratory.
- 625 CHEMISTRY SEMINAR** 1 credit  
Lectures on current research topics in chemistry by invited speakers.
- 629 PHYSICAL INORGANIC CHEMISTRY** 3 credits  
Prerequisites: 314, 472, or permission. Detailed treatment of chemistry of transition elements. Group theoretical applications, ligand field theory, kinetics and mechanism magnetism, electronic spectra, molecular orbital theory.
- 630 THEORETICAL INORGANIC CHEMISTRY** 2 credits  
Prerequisites: 314, 472, 629, or permission. Detailed treatment of chemistry of transition elements. Group theoretical applications, ligand field theory, kinetics and mechanism, electronic spectra, molecular orbital theory.
- 635 THERMODYNAMICS AND STATISTICAL THERMODYNAMICS** 3 credits  
Prerequisites: 313 and 314 or permission of instructor. Rigorous treatment of laws of thermodynamics and their applications to selected chemical systems. Fundamentals of statistical thermodynamics and applications to systems in chemical equilibrium.
- 636 CHEMICAL KINETICS** 3 credits  
Prerequisite: 635 or permission of the instructor. Phenomenological kinetics, experimental methods of investigation and analysis of reaction systems. Theoretical treatments of reaction rates.
- 639 DESCRIPTIVE INORGANIC CHEMISTRY** 3 credits  
Prerequisite: Undergraduate inorganic chemistry. The synthesis, characterization, structure, bonding, and reactivity of inorganic compounds. Emphasis is placed on applications and on examples from the recent literature.
- 640 CHEMICAL SEPARATIONS** 3 credits  
Prerequisites: 423 and 424 or equivalent. General theory, instrumentation and application of methods of separation. Emphasis on modern chromatographic techniques and recent advances.
- 641 SPECTRAL METHODS** 3 credits  
Prerequisites: 423 and 424 or equivalent. Theory and application of instrumental measurements. Interpretation of data.
- 642 ELECTROCHEMISTRY** 3 credits  
Prerequisites: 423 and 424 or equivalent. Theory and application of electrochemical methods of analysis.
- 645 X-RAY CRYSTALLOGRAPHY** 3 credits  
Prerequisite: permission. The theoretical and practical aspects of single crystal x-ray crystallography are discussed. Topics covered include diffraction, space groups, structure solution and refinement.
- 649 CHEMISTRY OF ELASTOMERS** 2 credits  
Prerequisites: 264, 266 or permission. Study of molecular structure and chemical reaction and properties of natural and synthetic rubbers; polymerization processes in formation of synthetic elastomers.
- 670 SPECTROSCOPIC IDENTIFICATION OF ORGANIC COMPOUNDS** 3 credits  
Prerequisites: 263, 264 or permission of instructor. Determination of the structures of organic compounds by spectroscopic analysis: ORD/CD, UV-VIS spectroscopy, IR spectroscopy, mass spectrometry, FT-NMR spectroscopy, 2D-NMR.
- 674,5 PHYSICAL CHEMISTRY OF POLYMERS I, II** 2 credits each  
Sequential. Prerequisite: 314 or permission of instructor. Basic statistical ideas. Molecular weights, distributions, sizes and shapes; kinetics and mechanism of polymerization; copolymerization; degradation; thermodynamics of polymer solutions.
- 683 MECHANISTIC AND SYNTHETIC ORGANIC CHEMISTRY I** 3 credits  
Prerequisites: 263, 264 or permission of instructor. Introduction to the structural and mechanistic aspects of organic reactions: HMO calculations, acids and bases, equilibrium, kinetics, linear free energy relationships, reactive intermediates, reaction mechanisms.
- 684 MECHANISTIC AND SYNTHETIC ORGANIC CHEMISTRY II** 3 credits  
Prerequisite: 683 or permission of instructor. Synthetic organic chemistry from a mechanistic perspective: nucleophilic and electrophilic substitution and addition reactions, carbonyl chemistry, functional group manipulations, oxidations, reductions, cycloaddition reactions.
- 685,6 EXPERIMENTAL PHYSICAL CHEMISTRY OF POLYMERS I, II** 2 credits for 685; 2-3 credits for 686  
Sequential. Prerequisites or corequisites: 674, 675, respectively. Laboratory to illustrate methods and principles discussed in 674 and 675.
- 699 MASTER'S THESIS** 1-6 credits  
For properly qualified candidates for master's degree. Supervised original research in analytical, inorganic, organic, physical or biochemistry.
- 701 CHEMICAL LITERATURE** 2 credits  
Prerequisite: permission. Online searching of chemical databases. Major emphasis is placed on chemical abstracts, but other databases are included. Lecture and online searching.
- 710 SPECIAL TOPICS: ANALYTICAL CHEMISTRY** 1-3 credits  
(May be repeated) Prerequisite: permission. Topics in advanced analytical chemistry. Electroanalysis, activation analysis, atomic absorption spectrometry, mass spectrometry, liquid-liquid, liquid-solid and gas chromatography, ion exchange, thermoanalytical methods, separations, standards, sampling, recent developments.
- 711 SPECIAL TOPICS: INORGANIC CHEMISTRY** 1-3 credits  
(May be repeated) Prerequisite: permission. Consideration of topics in modern inorganic chemistry such as coordination compounds, chemistry of the solid state, representative elements, nonaqueous solvents, organometallic compounds, homogeneous catalysis.
- 712 SPECIAL TOPICS: ORGANIC CHEMISTRY** 1-3 credits  
(May be repeated) Prerequisite: permission. Topics in advanced organic chemistry such as natural products, heterocyclic compounds, photochemistry.
- 713 SPECIAL TOPICS: PHYSICAL CHEMISTRY** 1-3 credits  
(May be repeated) Prerequisite: permission. Subject from modern physical chemistry.
- 714 SPECIAL TOPICS: POLYMER CHEMISTRY** 1-2 credits  
(May be repeated) Prerequisites: 264, 266, 314, 316 or permission. Study of topical subjects of current interest. Chemistry of macromolecules encompassing organic, inorganic or physical chemistry aspects and including laboratory work where applicable. Lectures and/or laboratory.
- 715 SPECIAL TOPICS: BIOCHEMISTRY** 1-3 credits  
(May be repeated) Prerequisite: permission. Recent developments in areas of biochemistry.
- 720 ADVANCED BIOCHEMICAL TECHNIQUES** 3 credits  
Prerequisite: 402/502. An advanced lecture course on physical techniques in biochemistry. Includes optical and hydrodynamic methods; radioanalytical techniques, scattering and magnetic resonance spectroscopy.
- 722 ENZYMATIC REACTIONS** 3 credits  
Prerequisites: 401/501, 402/502 or permission. Mechanisms of enzyme catalyzed reactions, general aspects and specific examples for phosphoryl, acyl, glycosyl transfers, eliminations, oxidation/reduction, isomerization and rearrangements. Chemistry of cofactors.
- 724 BIOINORGANIC CHEMISTRY** 3 credits  
Prerequisites: 401/501 and 402/502. Survey of the structure and properties of metal ion complexes with amino acids, nucleotides, metabolites and macromolecules, metal ion metabolism; metals in medicine.
- 726 ADVANCED METABOLISM** 3 credits  
Prerequisites: 401/501 and 402/502. Study of advanced pathways in carbohydrate, lipid and protein metabolism with emphasis placed on metabolic dysfunction.
- 740 PHYSICAL ORGANIC CHEMISTRY** 3 credits  
Prerequisites: 683, 684 or permission of instructor. An advanced treatment of the theory and mechanisms of organic chemistry: FMO theory, molecular mechanics, molecular strain, kinetics, thermodynamics, acidity functions, linear free energy relationships.
- 750 ADVANCED SYNTHETIC ORGANIC CHEMISTRY** 3 credits  
Prerequisites: 683, 684 or permission of instructor. An advanced treatment of organic functional group manipulations in the context of the total synthesis of natural products.
- 899 DOCTORAL DISSERTATION** 1-16 credits  
Open to qualified student accepted as a candidate for Doctor of Philosophy in Chemistry. Supervised original research undertaken in organic, inorganic, physical, analytical or biochemistry.

**CLASSICS****3200:**

- 501.2 EGYPTOLOGY I AND II** *3 credits each*  
The history and antiquities of ancient Egypt.
- 504.5 ASSYRIOLOGY** *3 credits each*  
(May be repeated for credit with another cuneiform language) Prerequisite: permission of instructor. The Akkadian language.
- 507.8 ANCIENT NEAR EASTERN ARCHAEOLOGY** *3 credits each*  
(May be repeated for credit with change of subject) Prerequisite: permission of instructor. Palestine, Mesopotamia, Asia Minor, adjacent lands; Old Testament in light of material evidence.
- 550 SELECTED TOPICS IN ANCIENT CULTURES** *3 credits*  
(May be repeated with change of subject) Varied offerings in literature, art and archaeology and religion. No foreign language necessary.
- 590 WORKSHOP IN CLASSICS** *1-3 credits*  
(May be repeated with change in topic) Group studies of special topics in Classics. Cannot be used to fulfill undergraduate major requirements in Classics; for elective credit only.
- 597.8 READING AND RESEARCH IN THE ANCIENT NEAR EAST** *1-3 credits*  
Prerequisite: permission of instructor. Advanced work in various aspects of Ancient Near Eastern Studies (Archaeology, Assyriology, Egyptology, etc.).

**GREEK****3210:**

- 597.8 GREEK READING AND RESEARCH** *3 credits each*  
(May be repeated for credit with change of subject) Prerequisite: permission of instructor. Homer, Sophocles, Plato or the like.

**LATIN****3220:**

- 597.8 LATIN READING AND RESEARCH** *3 credits each*  
(May be repeated for credit with change of subject) Prerequisite: permission of instructor. Generally Latin epigraphy, prose composition or philology; numismatics or certain other archaeological topics may be offered.

**ECONOMICS****3250:**

- 506 STATE AND LOCAL PUBLIC FINANCE** *3 credits*  
Prerequisite: 410; recommended: 405. Examines economic rationale and problems for provision of goods and services by different governmental units. Considers alternative revenue sources and special topics.
- 527 ECONOMIC FORECASTING** *3 credits*  
Prerequisite: 3470; 460, 461 or permission of instructor. Study of methods for building, identifying, fitting and checking dynamic economic models and the use of these models for forecasting. Emphasis is on the application of available computer software systems.
- 530 LABOR MARKET POLICY** *3 credits*  
Prerequisites: 330 or 333. Intensive study of current labor market policy issues (e.g., discrimination, poverty, the changing industrial structure, and the economics of education).
- 535 THE DEVELOPMENT OF AMERICAN CORPORATE STRUCTURE** *3 credits*  
Traces evolution of American corporate structure from late 19th Century to present. Explains and analyzes changing dimensions of corporate structure and response of government. Case studies analyzed.
- 540 SPECIAL TOPICS: ECONOMICS** *3 credits*  
Prerequisite: permission. Opportunity to study special topics and current issues in economics.
- 550 COMPARATIVE ECONOMIC SYSTEMS** *3 credits*  
Prerequisites: 200 and 201, or 244, or permission of instructor. Systems of economic organization, ranging from the theoretical extreme of a perfectly free market economy to the socialist varieties. Historical evolution of economic systems covering problems in theory and practice.
- 560 ECONOMIC DEVELOPMENT AND PLANNING FOR UNDERDEVELOPED COUNTRIES** *3 credits*  
Prerequisite: 200 and 201, or 244. Basic problems in economic development. Theories of development. Government planning for development. Trade and development of underdeveloped countries. Credit not available for students with credit for 3250:664.
- 575 DEVELOPMENT OF ECONOMIC THOUGHT** *3 credits*  
Prerequisites: 200 and 201, or 244. Evolution of theory and method, relation of ideas of economists contemporary to conditions.
- 581 MONETARY AND BANKING POLICY** *3 credits*  
Prerequisites: 380, 400. Control over currency and credit, policies of control by central banks and governments, United States Treasury and Federal Reserve System.
- 591 WORKSHOP IN ECONOMICS** *1-3 credits*  
(May be repeated) Group studies of special topics in economics. May not be used to meet undergraduate or graduate major requirements in economics. May be used for elective credit only.
- 600 FOUNDATIONS OF ECONOMIC ANALYSIS** *3 credits*  
Prerequisite: graduate standing. Determination of national income, employment and price level; aggregate consumption, investment and asset holding; decision problems faced by household and firm. Partial equilibrium and analysis of competition and monopoly and general equilibrium analysis. May not be substituted for 602, 603, 611, or applied toward the 30 graduate credits required for M.A. in economics.
- 602 MACROECONOMIC ANALYSIS I** *3 credits*  
Construction of static macroeconomic models. Analysis predominantly in terms of comparative statistics with only relatively brief mention of dynamic models.
- 603 MACROECONOMIC ANALYSIS II** *3 credits*  
Prerequisite: 602. Macrodynamics and stability analysis of closed and open Keynesian systems. Inclusive coverage of post-Keynesian theories of economic growth.
- 606 ECONOMICS OF THE PUBLIC SECTOR** *3 credits*  
Examination of public sector economies emphasizes public revenues, public expenditures. Develops objectives of taxation, welfare aspects of the public sector, theory of public goods. Considers specific taxes, cost-benefit analysis, expenditures analysis, fiscal federalism.
- 610 FRAMEWORK OF ECONOMIC ANALYSIS** *3 credits*  
Prerequisite: graduate standing. Development of theoretical and analytical framework for decision making. Discussion of applications of the framework to situations concerning demand, cost, supply, production, price, employment and wage.
- 611 MICROECONOMIC THEORY I** *3 credits*  
Modern theory of consumer behavior and of the firm. Determination of market prices. Optimization models, establishment of criteria for productive, allocative and distributive efficiency.
- 612 MICROECONOMIC THEORY II** *3 credits*  
Prerequisite: 611. Continuation of 611. Covers multimarket equilibrium, general equilibrium and welfare economic theory, and applications in public choice and applied welfare theory.
- 615 INDUSTRIAL ORGANIZATION** *3 credits*  
Prerequisite: 611 or permission. Examines link between market structure, firm conduct and economic performance. Measurement and effects of monopoly power, industrial concentration and changes.
- 616 ANTITRUST ECONOMICS** *3 credits*  
Prerequisite: 615 or permission of instructor. Economic rationale behind legislative and judicial decisions affecting mergers, vertical, horizontal restraints, monopolization, collusion, price discrimination.
- 617 THE ECONOMICS OF REGULATION** *3 credits*  
Prerequisite: 615 or permission of instructor. Examines rationale, methods and success of government regulation of public utility, transportation and communications industries.
- 620 APPLICATIONS OF MATHEMATICAL MODELS TO ECONOMICS** *3 credits*  
Prerequisites: courses in calculus, intermediate microeconomics or permission of the instructor. Review of selected topics of differential and integral calculus and their application to economic analysis. Theory of optimization in production and consumption; static macroeconomic models. Analysis of growth and stability.
- 621 APPLICATION OF LINEAR MODELS IN ECONOMIC ANALYSIS** *3 credits*  
Prerequisites: courses in intermediate microeconomics. Review of selected topics of linear algebra, application to economic theory. Static open and closed input-output tables, dynamic models, consumption technology and theory of demands, linear programming, general equilibrium analysis.
- 626 STATISTICS FOR ECONOMETRICS** *3 credits*  
Prerequisites: courses in elementary differential and integral calculus, 6500 321, 322 or equivalent. A review of statistical theory and its application to research in economics. Emphasis is on estimation and hypothesis testing as a prelude to econometrics.
- 627 ECONOMETRICS** *3 credits*  
Prerequisite: 626 or equivalent. Formulation of functional relations among economic variables suitable for statistical estimation from observational data and construction of multiequation econometric models and methods of estimation.
- 628 SEMINAR IN RESEARCH METHODS** *3 credits*  
Prerequisite: permission of instructor. A seminar in the research use of applied mathematical economics or econometrics. Emphasis is on individual development of a theoretical proposition or research statement, its empirical examination and policy implications.
- 633 THEORY OF WAGES AND EMPLOYMENT** *3 credits*  
Analytical approach to integration of economic theory with observed labor market phenomena. Discussion of wage and employment theories, effects of unions, collective bargaining theories and effects of government regulation.
- 634 COLLECTIVE BARGAINING** *3 credits*  
Economic issues and implications involved in hours of work, employment and unemployment, and the impact of trade unions upon basic institutions of a free private enterprise economy.
- 635 LABOR LAW** *3 credits*  
Evaluation of labor relations laws. Public policy affecting public, private worker organizations; collective bargaining; strikes; picketing.
- 636 COLLECTIVE BARGAINING II** *3 credits*  
Prerequisite: 635 or permission of instructor. Examination of process of negotiation. Course core is an actual contract negotiation. Student decides on issues, positions and tactics, then negotiates contract.
- 637 EMPLOYMENT LAW** *3 credits*  
Study of selected aspects of legislation and case decisions affecting employer-employee relations. Topics include employment-at-will; health and safety; wage, hours and benefits; arbitration.
- 639 PUBLIC SECTOR LABOR MARKETS** *3 credits*  
Prerequisite: 635 or permission of instructor. Examination of unique problem of public employees under collective bargaining agreements. Focus on legal framework, tripartite nature of negotiations and special situations facing public employees.
- 664 SEMINAR ON ECONOMIC GROWTH AND DEVELOPMENT** *3 credits*  
Review of main theories of economic growth since age of classical economics. Problems in development of emerging countries. Discussion of aggregative macromodels of capital formation, investment, technology and external trade.
- 665 SEMINAR ON ECONOMIC PLANNING** *3 credits*  
Types and methods of analysis of policy issues. Covers non-econometric methods, e.g., project analysis, mathematical programming, social accounting. Stresses applied problem solving and effective communication.
- 666 SEMINAR ON REGIONAL ECONOMIC ANALYSIS AND DEVELOPMENT** *3 credits*  
Study of a particular national or international regional development. Any one or a combination of following regions may be considered: Middle East, North Africa, areas within Latin America, Southern Europe, Southeast Asia or Eastern Europe.
- 670 INTERNATIONAL MONETARY ECONOMICS** *3 credits*  
International financial relations. Foreign exchange market and exchange rate adjustments. Balance of payments adjustment policies. International monetary system.
- 671 INTERNATIONAL TRADE** *3 credits*  
Traditional trade theory. Recent developments in trade theory, policy implications in trade relations among developed and developing economies.
- 683 MONETARY ECONOMICS** *3 credits*  
Intensive study of important areas of monetary theory. Emphasis on integration of money and value theory among other areas, plus some pressing policy issues.

- 697,8 READING IN ADVANCED ECONOMICS** 1-4 credits each  
(A maximum of six credits may be applied toward the master's degree in economics.) Intensive investigation of selected problem area in advanced economics under supervision of instructor. Since the subject matter is decided upon in each case, the course may be taken repeatedly for credit.
- 699 MASTER'S THESIS** 3 credits  
(May be repeated for a total of six credits)

## ENGLISH

### 3300:

- 500 ANGLO SAXON** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Studies in Old English language and Old English prose and poetry, including *Beowulf*.
- 503 DEVELOPMENT OF THE ARTHURIAN LEGEND** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Traces evolution of Arthurian materials from 540 to 1500 and beyond, with emphasis on characters, themes, events and treatments.
- 506 CHAUCER** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Close study of Chaucer's major works - *The Canterbury Tales* and *Troilus and Criseyde* in Middle English.
- 507 MIDDLE ENGLISH LITERATURE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of genres, topics, styles and writers of the Middle English literary works from 12th to 15th Centuries. Readings in Middle English.
- 512 SPENSER** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Close reading of major narrative and lyric poems and selections from the minor works, all studied in the context of Elizabethan aesthetic theory, learning and politics.
- 516 METAPHYSICAL POETS** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Selected 17th-Century British poets exclusive of John Donne. The course examines the particular styles and themes of the secular and sacred poets who wrote in the metaphysical mode. Particular emphasis is placed on Herbert, Crashaw, Vaughan, Traherne, Marvell, Cowley, Cleveland, Southwell and King.
- 521 SWIFT AND POPE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. An intensive study of the major satires of Swift and Pope. Concentration on the rhetorical strategies of each author within the context of the shifting intellectual and cultural milieu at the end of the 17th and beginning of the 18th Centuries.
- 524 EARLY ENGLISH FICTION** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Development of English novel before 1830. Focus on works of Defoe, Richardson, Fielding, Smollett, Sterne, Austen and Scott.
- 525 STUDIES IN ROMANTICISM** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Literary, philosophical, psychological and social revolutions of romantic period as reflected in works of such major writers as Wordsworth, Byron and Keats.
- 530 VICTORIAN POETRY AND PROSE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Poetry, prose of the late 19th Century, excluding fiction, with attention to Tennyson, Browning, Arnold, Carlyle, Ruskin and other major writers.
- 531 VICTORIAN FICTION** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Reading of at least five major novels of Victorian era, or varying length, by Emily Bronte, Dickens, Eliot, Thackeray and Hardy. Characterization, theme and attitude toward life emphasized.
- 534 CHARLES DICKENS** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Growth of Dickens as a novelist, with attention to the social and political backgrounds of the novels and changes in their structure and treatment of character.
- 535 20TH CENTURY BRITISH POETRY** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Concentrated study of major poems of Yeats, Eliot and Auden, with attention also to Hardy, Housman, Spender, C. Day Lewis, Dylan Thomas and others.
- 536 BRITISH FICTION: 1900-1925** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of Conrad, Joyce, D. H. Lawrence and Virginia Woolf, with attention to their innovations in narrative and style, their psychological realism and symbolism. Brief consideration of other important fiction writers of the period, including Wells, Bennett and Mansfield.
- 537 BRITISH FICTION SINCE 1925** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of important British novelists since 1925, excluding Lawrence, Joyce and Woolf. Attention to development of British short story from 1925 to present.
- 539 MODERN BRITISH AND IRISH DRAMA** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of major British dramatists, principally those of post-World War II. Focal figures are Shaw, Galsworthy, O'Casey, Osborne, Arden and Pinter.
- 543 MELVILLE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. A study of Herman Melville's life and works. Primary emphasis will be on Melville's major fiction (e.g., *Moby Dick*, *The Confidence Man*, *Billy Budd*), but some attention will also be given to his poetry and travel sketches.
- 546 AMERICAN AUTOBIOGRAPHY** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. An inquiry into the nature of autobiographical writing, with particular attention to the ontology of the "autobiographical self." Includes such authors as Henry Adams, Sherwood Anderson, Mark Twain, Gertrude Stein, Langston Hughes, William Carlos Williams, Loren Eiseley and Maya Angelou.
- 548 AMERICAN ROMANTIC FICTION** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Examination of early American fiction, tracing its genesis, romantic period and germinal movements toward realism. Writers discussed include Cooper, Poe, Hawthorne and Melville.
- 549 AMERICAN FICTION: REALISM AND NATURALISM** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Examination of American writers of realistic and naturalistic fiction (e.g., Howells, James, Crane, Dreiser), tracing developments in American fiction against background of cultural and historical change.
- 550 MODERN AMERICAN FICTION** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of significant American short and long fiction from World War I to the present.
- 551 AMERICAN POETRY TO 1900** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Survey of American poetry of the 17th, 18th and 19th Centuries.
- 552 MODERN AMERICAN POETRY** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Survey of 20th Century American poetry beginning with Edwin Arlington Robinson and ending with contemporary poets.
- 553 AMERICAN WOMEN POETS** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of modern poets' uses and revisions of tradition, treatment of relationships between women and men and between women, conceptions of art and of the artist-as-woman, and confrontation of the debate between "public" and "private" poetry.
- 554 20TH CENTURY AMERICAN DRAMA** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Examination of major, established playwrights (including O'Neil, Miller and Williams) and sampling of new and rising ones.
- 555 THE AMERICAN SHORT STORY** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. A study of the development of the short story as a particularly American genre, from Washington Irving to the present.
- 558 FAULKNER** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. An in-depth study of William Faulkner's major novels and short stories, primarily those set in the imaginary Yoknapatawpha region.
- 567 MODERN EUROPEAN FICTION** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Representative European writers from about 1850 to present, in translation. Focus on fiction of such writers as Zola, Tolstoy, Dostoyevsky, Mann, Proust, Kafka and Solzhenitsyn.
- 569 EROS AND LOVE IN EARLY WESTERN LITERATURE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. An analysis of the use of sex and love in the literature of the Western World from Greco-Roman times to 1800, with special emphasis on how sexuality and "romantic" love are used as allegorical, satiric, fantastic or realistic devices.
- 570 HISTORY OF ENGLISH LANGUAGE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Development of English language, from its beginnings: sources of its vocabulary, its sounds, its rules; semantic change, political and social influences on changes; dialect origins; correctness.
- 571 U.S. DIALECTS: BLACK AND WHITE** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Study of differences in pronunciation, vocabulary and grammar among U.S. language varieties. Origins, regional and social dimensions are explored. Correctness, focusing on black English and Appalachian speech, explored.
- 572 SYNTAX** 3 credits  
Prerequisite: 371, and Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Principles of syntactic description. Sentence structures are investigated from a variety of languages, with emphasis on English.
- 573 SEMINAR IN TEACHING ESL: THEORY AND METHOD** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Theoretical issues in linguistic description and language acquisition as relevant to learning of a second language. Elaboration of principles for the teaching of English as a second language based on research in linguistics, psycholinguistics and second language pedagogy.
- 575 THEORY OF RHETORIC** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Ancient and modern theories of rhetoric, with attention to classical oration, "topics" of rhetoric and their application to teaching of English.
- 583 FANTASY AND SCIENCE FICTION** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. Selected British and American fantasy and science fiction from the 1880s to the present.
- 584 FANTASY** 3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. A study of forms of literature, primarily fiction, based on and controlled by an overt violation of what is generally considered as possibility.
- 589 SEMINAR IN ENGLISH** 2-3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. (May be repeated with different topics.) Special studies, and methods of literary research, in selected areas of English and American literature and language.
- 590 WORKSHOP IN ENGLISH** 1-3 credits  
Prerequisite: Completion of 1100:111 and 1100:112 or their equivalents, or permission of the instructor. (May be repeated with different topics.) Group studies of special topics in English. Cannot be used to meet undergraduate or graduate major requirements in English, for elective credit only.
- 600 TEACHING COLLEGE COMPOSITION PRACTICUM** 3 credits  
Prerequisite: teaching assistantship. Orientation and weekly analysis of teaching rationale and practice, limited to teaching assistants in the Department of English.
- 615 SHAKESPEAREAN DRAMA** 3 credits  
Concentrated study of several Shakespearean plays with emphasis on historical, critical and dramatic documents pertinent to development of Shakespeare's art.
- 616 SHAKESPEARE'S CONTEMPORARIES IN ENGLISH DRAMA** 3 credits  
Readings in such playwrights as Lyle, Greene, Marlowe, Jonson, Beaumont, Fletcher, Webster, Middleton and Ford and in contemporary writings relevant to theory and practice of drama.

- 618 MILTON** *3 credits*  
Emphasis on Milton's major poems and prose works: *Paradise Lost*, *Paradise Regained*, *Areopagitica*. Student becomes acquainted with Milton the man and Milton the artist.
- 627 KEATS AND HIS CONTEMPORARIES** *3 credits*  
Writings of John Keats, studied against background of romantic poetic theory and poetry of Keats' contemporaries.
- 639 THEORY AND PRACTICE OF MODERN POETRY** *3 credits*  
Study of modern prosody, critical theories of modern poetry and relation between writer's theory and practice, with particular attention to Frost, Stevens, Yeats and Eliot.
- 642 SEMINAR IN DICKINSON** *3 credits*  
An in-depth study of Dickinson's poetry, with special attention to her varied poetic identities and their relationship to her life, and an examination of some of the major critical approaches to her poetry.
- 643 SEMINAR IN JAMES** *3 credits*  
A study of Henry James' life and works. Primary emphasis will be on James' fiction, both long and short, early and late; but some attention will also be given to his literary criticism, travel pieces and plays.
- 665 LITERARY CRITICISM** *3 credits*  
Inquiry into nature and value of literature and problems of practical criticism as represented in major statements of ancient and modern critics.
- 670 MODERN LINGUISTICS** *3 credits*  
Introductory examination of methods and results of modern grammatical research in syntax, semantics, phonology and dialects. Goals include understanding of language variation and background preparation for linguistic studies of literature.
- 673 THEORIES OF COMPOSITION** *3 credits*  
Study of composition theories and research, with attention to their implications for writing and writing instruction. Particular focus on such topics as composing processes, invention, form, style, modes of writing, language varieties and evaluation of writing. Class sessions include discussion of readings and presentations.
- 674 RESEARCH METHODOLOGIES IN COMPOSITION** *3 credits*  
Research methodologies in composition and their application. Students will define research areas, summarize and evaluate work already done, and propose and complete semester research projects.
- 675 WRITING FOR MBAs** *3 credits*  
Emphasizes managerial writing. Writing tasks are presented as decision-making tools, and students develop strategies for messages to subordinates, analytical reports and messages to outside audiences.
- 676 THEORY AND TEACHING OF BASIC COMPOSITION** *3 credits*  
Review of current research and exploration of specific instructional methods for teaching basic composition.
- 679 SCHOLARLY WRITING** *3 credits*  
Study of composing, analyzing and evaluating academic arguments. Practice in specific forms of academic writing such as reviews of research, articles and book reviews.
- 683 SEMINAR IN SATIRE** *3 credits*  
A study of satire from the middle ages through the late 20th Century, with particular attention to techniques of satiric attack, modes of comedy and irony and literary criticism.
- 689 SEMINAR IN ENGLISH** *2-3 credits*  
(May be repeated with change of topics) Special topics within the general field of literature and language, usually focusing on major figures or themes.
- 691 BIBLIOGRAPHY AND LITERARY RESEARCH** *3 credits*  
Choosing research topics, typical problems in literary scholarship, abstracting of scholarly material and bibliographic sources for literary research. Bibliographic exercises done, models of literary scholarship read.
- 698 INDIVIDUAL READING IN ENGLISH** *1-3 credits*  
Individual study under guidance of professor who directs and coordinates student's reading and research.
- 699 MASTER'S THESIS** *1-6 credits*  
Original work in the field of literature and language and completion of graduate student's required thesis.
- 538 WORLD METROPOLITAN AREAS** *3 credits*  
Prerequisite: 330 or permission. Comparative analysis of metropolitan regions. Urbanism, land use, housing, transportation, population and role of cities in economic development in different cultures.
- 539 DEVELOPMENT OF AMERICAN PLANNING** *3 credits*  
Prerequisite: 533 or permission. Explores the growth of urban and regional planning theory and practice and the development of a planning profession, particularly in the twentieth century.
- 540 PRINCIPLES OF CARTOGRAPHY** *3 credits*  
Theoretical and practical applications of cartographic principles used to design and produce maps for research reports, public presentations, publication, and other professional uses.
- 542 THEMATIC CARTOGRAPHY** *3 credits*  
Prerequisite: 340 or permission. Principles and techniques of thematic mapping. Stresses maps as communication tools. Examines principal thematic mapping techniques and means of presenting quantitative and qualitative data. Laboratory.
- 544 APPLICATIONS IN CARTOGRAPHY AND GEOGRAPHIC INFORMATION SYSTEMS** *3 credits*  
Prerequisite: 340 or 540 and 405 or 505 or permission. Application of analytic and presentation techniques from cartography and geographic information systems to practical problems in geography and planning. Laboratory.
- 547 INTRODUCTION TO REMOTE SENSING** *3 credits*  
Prerequisite: 341 or permission. Study of aerial photography and non-photographic imagery developed by radar, thermal, multispectral and satellite scanners. Emphasis on use in geographical, geological, biological and engineering research.
- 548 ADVANCED CARTOGRAPHY** *3 credits*  
Prerequisite: 340/540 or permission. Advanced study of cartographic principles with an emphasis on the use of color for map design and production. Laboratory activities.
- 549 ADVANCED REMOTE SENSING** *3 credits*  
Prerequisite: 447/547 or permission. Current research in remote sensing. Applications in study of human cultural and biophysical environment. Practice in planning, design, execution and interpretation of remote sensing studies.
- 550 DEVELOPMENT PLANNING** *3 credits*  
A study of planning concepts and techniques for developing countries, including growth and development, planning agencies, regional inequities and alternative approaches.
- 571 MEDICAL GEOGRAPHY AND HEALTH PLANNING** *3 credits*  
Spatial analysis of diseases; their socioeconomic correlates; diffusion pattern of infectious diseases with particular reference to North America; health-planning processes and spatial analysis of health-care delivery systems.
- 581 RESEARCH METHODS IN GEOGRAPHY AND PLANNING** *3 credits*  
Prerequisites: 12 credits in geography and planning. Investigation of library and archive resources. Emphasis on development of professional writing skills.
- 583 SPATIAL ANALYSIS** *3 credits*  
Prerequisite: 481/581 or permission. Analysis of mapped statistical surfaces. Principles for use of map as model for statistical evidence, prediction, hypothesis testing.
- 589 SPECIAL TOPICS IN GEOGRAPHY** *1-3 credits*  
(May be repeated) Selected topics of interest in geography.
- 590 WORKSHOP IN GEOGRAPHY** *1-3 credits*  
(May be repeated for a total of six credits) Group studies of special topics in geography.
- 595 SOIL AND WATER FIELD STUDIES** *3 credits*  
Prerequisite: 310 or permission. Properties, origins and uses of major soil and water regime landscapes. Stresses relationships between soil and the hydrological cycle, urbanization, suburbanization and agriculture. Field trips required.
- 596 FIELD RESEARCH METHODS** *3 credits*  
Prerequisite: 481/581 or permission. Field work enabling student to become competent in collecting, organizing and analysis of data while carrying out field research projects.
- 600.12 SEMINAR** *3 credits each*  
(May be repeated for a maximum of six credits each) Prerequisite: permission. Investigation and analysis of selected topics in particular fields of geography. Specialization indicated by second portion of title.
- 630 PLANNING THEORY** *3 credits*  
Introduction to the political, institutional and ethical foundations and procedural theories of urban and regional planning.
- 631 FACILITIES PLANNING** *3 credits*  
Study of need, process and limitation of urban facilities planning.
- 632 LAND USE PLANNING LAW** *3 credits*  
Prerequisite: permission. Acquaint student with past and present approaches to land use control in the United States and examine the political, economic, social and legal forces which have shaped existing land-use legislation.
- 633 COMPARATIVE PLANNING** *3 credits*  
A survey of national, regional and local planning implementation measures in use in the developed world. Particular attention will be given to the planning experiences of European nations and their impact on American planning theory and practice.
- 637 METHODS OF PLANNING ANALYSIS I** *3 credits*  
Prerequisite: 630. Introduction to the primary analytic techniques for small-area demographic and economic analysis and projection.
- 638 METHODS OF PLANNING ANALYSIS II** *3 credits*  
Prerequisite: 630. Review of the primary techniques for comprehensive plan preparation, evaluation and implementation.
- 680 ADVANCED SPATIAL ANALYSIS** *3 credits*  
Prerequisite: 483/583 or permission. Advanced concepts and methodologies in geographic research. Emphasis on quantitative revolution in geographical analysis including multivariate procedures as factor, discriminant and economical analysis, and multidimensional scaling.
- 685 PLANNING INTERNSHIP** *3 credits*  
Prerequisite: permission. Individual experience in selected planning agencies for supervised performance in professional planning work.
- 687 HISTORY OF GEOGRAPHIC THOUGHT** *3 credits*  
Prerequisite: 481/581 or permission. Critical review of major developments in geographic concepts from ancient times to present.
- 698 INDIVIDUAL READING AND RESEARCH** *1-3 credits*  
(May be repeated for a total of six credits) Prerequisite: permission of instructor. Intensive investigation of selected topics under guidance of faculty member.
- 699 THESIS RESEARCH** *1-6 credits*  
Independent and original work toward a thesis.

## GEOGRAPHY AND PLANNING

### 3350:

- 503 COMPUTER APPLICATIONS IN GEOGRAPHY AND PLANNING** *3 credits*  
Application of advanced information technologies to geography and planning, including operating systems, electronic spreadsheets, data base management systems, and the Internet. Laboratory.
- 505 GEOGRAPHIC INFORMATION SYSTEMS** *3 credits*  
Prerequisites: 540 and 503 or permission. Introduction to the principles and concepts underlying geographic information systems (GIS) and their application in professional practice and academic research. Laboratory.
- 507 ADVANCED GEOGRAPHIC INFORMATION SYSTEMS** *3 credits*  
Prerequisite: 505. Advanced instruction in the theory and application of geographic information systems (GIS) including hands-on experience with both raster and vector GIS. Laboratory.
- 522 TRANSPORTATION SYSTEMS PLANNING** *3 credits*  
Prerequisite: 320 or permission. Study and analysis of transportation systems from a geographic perspective. Emphasis on transportation problems and issues, elements of transportation planning.
- 528 INDUSTRIAL AND COMMERCIAL SITE LOCATION** *3 credits*  
Prerequisite: 320 or permission. Relationship between land, resources, population, transportation and industrial and commercial location process.
- 533 INTRODUCTION TO PLANNING** *3 credits*  
Prerequisite: 330 or permission. Role of geographic investigation in city, regional and resource planning.
- 536 URBAN LAND USE ANALYSIS** *3 credits*  
Prerequisite: 330 or permission. Land use classification systems and their spatial variation in urban areas. Land use data are collected by student by field work and analyzed to identify the associations and structure of subregions.

**GEOLOGY****3370:**

- 505 ARCHAEOLOGICAL GEOLOGY** 3 credits (includes lab)  
Prerequisite: 101 or by permission of instructor. Provides background in geologic principles and techniques relevant to archaeologists. Topics include stratigraphy, absolute dating, locality assessment, zooarchaeology, taphonomy, and remote sensing. Required lab.
- 510 REGIONAL GEOLOGY OF NORTH AMERICA** 3 credits  
Prerequisites: 101, 102, 210 or permission, recommended: 350. Examination of physiographic provinces of North America emphasizing structure, tectonic setting, stratigraphy and processes responsible for landforms in each province. Laboratory.
- 511 GLACIAL GEOLOGY** 3 credits  
Prerequisite: 210 or permission. Causes and effects of Pleistocene expansion of polar ice masses with emphasis on glacial deposits and world climatic changes.
- 521 COASTAL GEOLOGY** 3 credits  
Prerequisites: 101, 324 or permission of instructor. Study of the origins and evolution of coasts and coastal deposits with particular attention paid to the interaction of waves and currents with sediment, and the development of associated sedimentary features.
- 525 ADVANCED STRATIGRAPHY** 3 credits  
Prerequisites or corequisites: 360, 324 or permission. Emphasis on correlation, depositional systems, sedimentation and tectonics, seismic stratigraphy, and terrain analysis. Laboratory in the field.
- 532 OPTICAL MINERALOGY-INTRODUCTORY PETROGRAPHY** 3 credits  
Prerequisites: 230 and 231 or equivalent. Optical techniques for identification, characterization, and classification of minerals and rocks using the petrography microscope. Laboratory.
- 533 ADVANCED PETROGRAPHY** 3 credits  
Prerequisite: 532. Petrogenesis of igneous, metamorphic and sedimentary rocks as determined by microscopic studies of textures and mineral assemblages using thin section. Laboratory.
- 535 PETROLEUM GEOLOGY** 3 credits  
Prerequisite: 350 or permission; recommended: 324. Natural occurrences of petroleum. Characteristics, origin, entrapment and exploration methods. Laboratory.
- 536 COAL GEOLOGY** 3 credits  
Prerequisites: 101, 102; recommended: 324. Origin, composition and occurrence of coal with emphasis on depositional environments, coalification processes, exploration, evaluation and exploitation. Laboratory.
- 537 ECONOMIC GEOLOGY** 3 credits  
Prerequisites: 231 and 350. Study of metallic and nonmetallic mineral deposits emphasizing paragenesis and exploration. Laboratory.
- 541 FUNDAMENTALS OF GEOPHYSICS** 3 credits  
Prerequisites: 3450:223 or permission and 3650:292. Fundamental concepts in solid earth geophysics, planetary physics, geodesy, and geomagnetism. Contributions of geophysics to recent major developments in geoscience.
- 546 EXPLORATION GEOPHYSICS** 3 credits  
Prerequisites: 3450:223, 3650:292 or permission. Basic principles and techniques of geophysical exploration with emphasis on gravimetric, magnetic, seismic and electrical methods and application to geological problems. Laboratory.
- 549 BOREHOLE GEOPHYSICS** 3 credits  
Prerequisite: permission of instructor. Basic principles and techniques of geophysical well logging with emphasis on electrical, radioactive and sonic measures and their quantitative evaluation. Applications in oil, gas and groundwater exploration. Laboratory.
- 550 ADVANCED STRUCTURAL GEOLOGY** 3 credits  
Prerequisite: 350 or permission. Fundamental and advanced concepts of structural geology with emphasis on current and developing concepts. Laboratory.
- 562 ADVANCED PALEONTOLOGY** 3 credits  
Prerequisite: 360 and 360 lab. Provides advanced training in paleontological subjects. Topics will include paleoenvironmental analysis, biostratigraphic correlation, fossil preservation, diversification and extinction patterns and geochemical signals of fossils.
- 563 MICROPALAEONTOLOGY** 3 credits  
Prerequisite: 360 or permission. Introduction to techniques of micropaleontology evolution and paleoecology of selected microfossil groups. Laboratory.
- 570 GEOCHEMISTRY** 3 credits  
Prerequisites: 101, 230, 231, 3150:132, 133, or permission. Application of chemical principles to the study of geologic processes. Laboratory.
- 572 STABLE ISOTOPE GEOCHEMISTRY** 3 credits  
Prerequisites: 3150:151, 152, 153; 3450:221; 3370:101, 102. Application of stable isotope geochemistry to the study of the hydrologic and carbon cycles, modern sedimentary environments, and the interpretation of sedimentary rocks.
- 574 GROUNDWATER HYDROLOGY** 3 credits  
Prerequisite: 101. Origin, occurrence, regimen and utilization of groundwater. Qualitative and quantitative presentation of geological and geochemical aspects of groundwater hydrology. Laboratory.
- 581 ANALYTICAL METHODS IN GEOLOGY** 2 credits  
Prerequisites: 230 and 231. A survey of analytical methods used to solve geologic problems with emphasis on method selection, proper sample collection, analysis of data quality and data presentation.
- 584 GEOSCIENCE INFORMATION ACQUISITION AND MANAGEMENT** 1 credit  
Prerequisite: must be a Geology Department graduate student or senior major in geology, or have permission of instructor. Methods for finding, gathering, managing, and evaluating geoscience information. Emphasis on finding data sources (including electronic), creating valid data sets, visualizing data.
- 585 INDIVIDUAL READINGS IN GEOLOGY** 1-4 credits  
Prerequisite: permission of graduate advisor required. (May be repeated for a total of 8 credits; credits may not be used to meet degree requirements.) Directed reading to fit individual student programs. Credit/Noncredit.
- 590 WORKSHOP** 1-3 credits  
(May be repeated) Group studies of special topics in geology. May not be used to meet undergraduate or graduate major requirements in geology. May be used for elective credit only.
- 593 GEOLOGY FIELD CAMP I** 3 credits  
Prerequisites: 101 and 102 and permission of instructor. Introduction to collection and interpretation of field data and construction of geological maps.
- 594 GEOLOGY FIELD CAMP II** 3 credits  
Prerequisites: 231, 350, 493/593 or permission of instructor. Advanced techniques and methods of field geology necessary for detailed geological maps and interpretation.
- 608 REMOTE SENSING IN GEOLOGY** 3 credits  
Prerequisite: 3350: 447/547 or equivalent. Techniques for analysis and processing of remotely sensed data from conventional and satellite sensing systems. Applications to local, regional and global geologic and environmental geology problems. Laboratory.
- 610 APPLIED QUANTITATIVE GEOMORPHOLOGY** 3 credits  
Prerequisite: 210. Quantification of geomorphic processes and associated landforms. Application of statistical methods and evaluation of validity of these methods. Examination of these methods in practical problems. Laboratory.
- 623 CARBONATE PETROLOGY** 3 credits  
Prerequisites: 324 and 432/532 or permission of instructor. Detailed examination of selected carbonate suites with emphasis on depositional facies and diagenetic alteration. Laboratory.
- 624 SILICICLASTIC SEDIMENTOLOGY** 3 credits  
Prerequisites: 324 and 433/533 or permission of instructor. Basic processes that transport and settle sediment and the stratification associated with these processes. Furthermore, the study of depositional systems and associated facies architecture. Laboratory.
- 631 ROCKS AND MINERALS** 4 credits  
Prerequisites: 101 and permission. Intensive course integrating crystallography, mineralogy and petrology for the science teacher and graduate student from disciplines other than geology. Laboratory.
- 632 IGNEOUS PETROLOGY** 3 credits  
Prerequisites: 433/533. Origin and paragenesis of igneous rocks. Theory, petrochemistry and occurrences of major igneous rock types. Selected rock suites studies. Laboratory.
- 633 METAMORPHIC PETROLOGY** 3 credits  
Prerequisite: 433/533. Textures, chemistry of metamorphic reactions, phase diagrams and occurrences of metamorphic rocks. Selected rock suites studied. Laboratory.
- 634 CLAY MINERALOGY** 3 credits  
Prerequisite: 432/532. Classification, identification, genesis of clay minerals, clay rocks, use, exploitation. Laboratory stresses methods of identification of clay minerals, analysis, petrogenetic interpretation of clay materials in suites of samples from the rock record. Laboratory.
- 639 NUCLEAR GEOLOGY** 3 credits  
(Two hour lecture, three hour laboratory) Prerequisites: minimum of seven credits in chemistry, eight credits in physics, eight credits in calculus and eight credits in geology or permission. Discusses nature of radioactive and stable isotopes, their applications in geology, radioactive minerals, radioactive background and disposal of radioactive wastes. Nuclear analytical techniques will also be discussed; lecture, laboratory and field study.
- 643 GEOSTATISTICS** 3 credits  
Prerequisites: 101, 3470:461/561 or an equivalent course in statistics. Application of statistical methods to geology and geophysics including tests of hypotheses, trend surface analysis, analysis of variance, nonparametric statistics and time series analysis.
- 656 GLOBAL TECTONICS** 3 credits  
Prerequisites: 350, 441/541 or permission. Theoretical study of physical forces involved in formation and deformation of earth's crust with emphasis on plate tectonics and associated diastrophic features.
- 661 GEOLOGIC RECORD OF PAST GLOBAL CHANGE** 3 credits  
Prerequisite: equivalent of baccalaureate degree in geology or permission of instructor. Study of the geologic record of past global climate and environmental change from geochemical, paleontological, sedimentological and other geological evidence.
- 674 ADVANCED GROUNDWATER HYDROLOGY** 3 credits  
Prerequisite: 474/574. Study of water table and artesian aquifers under steady and nonsteady state conditions. Collection and evaluation of field data with regard to theory. Water well and well field design. Laboratory and field work.
- 675 GEOCHEMICAL METHODS OF PROSPECTING** 2 credits  
Prerequisites: nine credits of chemistry, nine credits of mineralogy and/or petrology; recommended: 537 and 570. Application of geochemical methods of analysis and interpretation to search for ore deposits; emphasis on stability, mobility and associations of elements in geologic environments. Laboratory.
- 678 URBAN GEOLOGY** 3 credits  
Prerequisites: 210, 230 or permission. Problems of urbanization related to our finite resources and creation of wastes. Geologic hazards. Case histories. Application of geologic data to urban development.
- 680 SEMINAR IN GEOLOGY** 2 credits  
(May be repeated for a total of six credits) Selected topics with reference material from original sources.
- 684 SELECTED TOPICS IN GEOLOGY** 1-3 credits  
(May be repeated for a total of eight credits) Prerequisite: permission. Topics not regularly offered as formal courses, generally of classic current importance. Entails lectures, readings, discussions and/or guided laboratory work.
- 688 GEOLOGY TEACHING PRACTICUM** 2 credits  
Corequisite: graduate assistantship. Training and experience in college teaching of geology under supervision of experienced faculty. May be repeated for a maximum of 8 credits. Credits may not be used to meet degree requirements. Credit/Noncredit.
- 695 ADVANCED FIELD STUDIES** 1-2 credits  
(May be repeated for a total of four credits) Prerequisite: permission of instructor. Field trip course emphasizing phases of geology not readily studied in Ohio. Includes pretrip preparation, field observations and data gathering, post-trip examination and/or written report. Student will bear trip expenses.
- 696 GEOLOGY COLLOQUIUM** 1 credit  
Lecture on current topics in geological sciences and thesis proposals and defenses by graduate students. May be repeated. Does not satisfy degree requirements.
- 698 GRADUATE RESEARCH PROBLEMS** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: permission. Directed reading and research in an aspect of geology chosen by student in consultation with an instructor.
- 699 MASTER'S THESIS** 1-6 credits  
Independent and original investigation. Must be successfully completed, report written and defended before a committee.

# HISTORY

## 3400:

- 500 WOMEN IN REVOLUTIONARY CHINA** 3 credits  
Prerequisites: 3400.300, 301, or 1100.330, or permission of instructor. A study of the changes in women's lives in China during the late imperial (1644-1911), and socialist (1949-1989) periods.
- 501 IMPERIALISM IN EAST ASIA** 3 credits  
An examination of the East Asian relations in the modern period, highlighting China's response to British, Russian and Japanese imperialism in the 19th and 20th centuries.
- 504 STUDIES IN ROMAN HISTORY** 3 credits  
Prerequisite: completion of 6 hours of History courses at the 200 or 300 level. Concentrated investigation of selected topics such as imperialism in middle and late Republic, the age of Augustus, or the fall of western Empire.
- 516 MODERN INDIA** 3 credits  
History of the Indian subcontinent from c.1500 with emphasis on Indian society and culture, British imperialism, and the emergence of Indian nationalism.
- 524 THE RENAISSANCE** 3 credits  
The age of transition from the Middle Ages to modern times (1350-1600). Special emphasis on intellectual trends, the development of humanism, and the fine arts.
- 525 THE REFORMATION** 3 credits  
Europe in 16th Century, its religious, cultural, political and diplomatic development, with special emphasis on Protestant, Anglican and Catholic reformations.
- 529 EUROPE IN THE FRENCH REVOLUTIONARY ERA, 1789-1815** 3 credits  
Development of Revolution; Napoleon's regime and satellites.
- 538 NAZI GERMANY** 3 credits  
This course covers the social, economic, and political history of Germany from World War I to 1945 with emphasis on the Third Reich.
- 539 EUROPE IN THE COLD WAR** 3 credits  
Prerequisites: 6 hours of 3400 courses at the 200 or 300 level, or permission of the instructor. The political, social and cultural history of Europe from the end of the Second World War to the Revolutions of 1989.
- 540 TUDOR AND STUART ENGLAND, 1485-1714** 3 credits  
Emphasis on social, economic and cultural topics, including literature, art and architecture.
- 543 CHURCHILL'S ENGLAND** 3 credits  
An examination of the changes that Britain experienced during the life of Winston Churchill, 1874-1965. Emphasis is on cultural, social, and political developments.
- 550 THE AMERICAN COLONIES IN THE 17TH CENTURY, 1607-1713** 3 credits  
Establishment of European colonies in America with special emphasis on English settlements and evolution of the first British Empire to 1713.
- 551 THE 18TH CENTURY COLONIES AND FOUNDING OF THE UNITED STATES, 1713-1800** 3 credits  
Colonial life from the Glorious Revolution to the founding of the United States. Major movements (wars, religious revivals, economic growth) and political controversies.
- 552 THE AMERICAN REVOLUTIONARY ERA: POLITICAL, MILITARY, AND CONSTITUTIONAL ASPECTS** 3 credits  
The struggle for the rights of Englishmen and independence; the impact of war on American society and the creation of republican institutions.
- 553 AGE OF JEFFERSON AND JACKSON, 1800-1850** 3 credits  
The evolution of the republic in its formative stages from Jefferson through Jackson to the Compromise of 1850. Emphasis upon political, social, intellectual and Constitutional developments.
- 554 THE CIVIL WAR AND RECONSTRUCTION, 1850-1877** 4 credits  
Sectionalism, slavery and the causes of the Civil War, wartime activities of the Union and Confederacy, leading personalities, problems of reconstruction and the new Union.
- 555 THE ORIGINS OF MODERN AMERICA, 1877-1917** 3 credits  
United States from Reconstruction Era to World War I (1877-1920); emphasis on political responses to rise of an industrialized-urbanized society, the populist and progressive movements.
- 556 AMERICA IN WORLD WARS AND DEPRESSION, 1917-1945** 3 credits  
World War I and Versailles, the 1920s, the Great Depression and the New Deal, World War II.
- 557 RECENT AMERICA: THE UNITED STATES SINCE 1945** 3 credits  
Nuclear age, cold war, foreign policy and domestic affairs to present. Social, political, constitutional, diplomatic, cultural and economic changes since 1945.
- 560 UNITED STATES DIPLOMACY TO 1919** 3 credits  
Establishment of basic policies, diplomacy of expansion and emergence of a world power.
- 561 UNITED STATES DIPLOMACY SINCE 1914** 3 credits  
Responses of government and public to challenges of war, peace making and power politics.
- 562 U.S. CONSTITUTIONAL HISTORY TO 1870** 3 credits  
This course will examine the creation of the U.S. Constitution and Bill of Rights as well as constitutional evolution through the Civil War.
- 563 U.S. CONSTITUTIONAL HISTORY SINCE 1870** 3 credits  
This course will examine the evolution of constitutional government as well as civil liberties and individual rights from the Civil War to the present.
- 564 AMERICAN ECONOMY TO 1900** 3 credits  
Survey of economic developments from colonial era, including agriculture, commerce, labor. Special emphasis on role of big business and evolution of monetary and fiscal policy.
- 565 AMERICAN ECONOMY SINCE 1900** 3 credits  
Survey of economic developments since 1900; topics include agriculture, business and labor. Special emphasis on role of big business and evolution of monetary and fiscal policy.
- 566 UNITED STATES SOCIAL-CULTURAL HISTORY TO 1877** 3 credits  
Concepts and attitudes considered in their social, cultural framework. Emphasis on population growth, rural and urban life, literature, the arts, family life, slavery and impact of Civil War.
- 567 UNITED STATES SOCIAL-CULTURAL HISTORY SINCE 1877** 3 credits  
Concepts and attitudes, emphasis on business; agrarianism; self-made individuals; progressivism; impact of world wars; social-economic planning; trends in literature and art; social structure and change; black Americans; women's movements.
- 570 OHIO HISTORY** 3 credits  
Political, social, economic and intellectual history of Ohio, with special emphasis on Ohio's relationship to Old Northwest and to the nation.
- 571 AMERICAN ENVIRONMENTAL HISTORY** 3 credits  
Utilization, conservation of natural resources from beginnings of American society to present; combination of economic, technological history of extensive treatment of public policy, environmental issues.
- 572 LATIN AMERICA: ORIGINS OF NATIONALITY** 3 credits  
Pre-Columbian civilization, discovery and conquests; colonialism, struggle for independence and formation of new societies.
- 573 LATIN AMERICA: THE TWENTIETH CENTURY** 3 credits  
Social revolution, political ideology and contemporary problems.
- 575 MEXICO** 3 credits  
History of Mexico from Indian civilizations to present with emphasis on relations with United States, social and political ramifications of the 20th Century Mexican revolution.
- 576 CENTRAL AMERICA AND THE CARIBBEAN** 3 credits  
Selected aspects of the histories of Central American and Caribbean countries with emphasis on populist and peasant movements, political reform, social revolution, economic and underdevelopment, and relations with the United States.
- 581 HISTORY OF CANADA** 3 credits  
Survey of Canadian history from the age of the explorers to the present. Special emphasis will be placed on the history of French-Canadians, on economic development and on Canadian-American relations.
- 582 WAR AND WESTERN CIVILIZATION** 3 credits  
War and society in Europe, America and beyond from ancient world to present with special emphasis on period since 1740.
- 584 HISTORICAL AGENCY ADMINISTRATION** 3 credits  
Organization and administration of non-academic historical agencies (e.g. societies, museums, libraries, etc.). Some field experience in a local historical agency.
- 585 FUNCTIONS OF HISTORICAL AGENCIES** 3 credits  
Prerequisite: 400/510 or permission. The functions and programs of historical agencies. Student will develop a project that involves participating in an agency function.
- 586 WESTERN SCIENCE TO 1800** 3 credits  
Science in Greek, Roman, Islamic, European societies with special emphasis on the scientific revolution of the 16th and 17th Centuries.
- 587 WESTERN SCIENCE SINCE 1800** 3 credits  
Continuing development of physical, medical, biological sciences in European and American societies. Atomic physics and weapons, evolution, genetics, modern medicine.
- 588 WESTERN TECHNOLOGY** 3 credits  
Technology in Mesopotamia, Egypt, Greece, Rome, Islam, medieval Europe; first and second industrial revolutions in Europe, America.
- 593 SPECIAL STUDIES IN HISTORY** 3 credits  
Includes experimental and interdisciplinary studies, as well as those subjects that are not listed in this *Graduate Bulletin*. See departmental office for information on particular offerings.
- 594 WORKSHOP IN HISTORY** 1-3 credits  
(May be repeated) Group studies of special subjects pertaining to history. May be used for elective credit only. May not be used to meet undergraduate or graduate major requirements in history.
- 622 READING SEMINAR IN ANCIENT HISTORY** 4 credits  
Study of historical literature, sources of materials and major interpretations of ancient history, especially Greek and Roman periods.
- 623 WRITING SEMINAR IN ANCIENT HISTORY** 4 credits  
Prerequisite: 622. Research and writing in selected topics of ancient history, particularly Greek and Roman eras.
- 625 READING SEMINAR IN MEDIEVAL HISTORY** 4 credits  
Study of historical literature, sources of materials and major interpretations of medieval European history.
- 626 WRITING SEMINAR IN MEDIEVAL HISTORY** 4 credits  
Prerequisite: 625. Research and writing in selected topics of European medieval history from barbarian invasions through later Middle Ages.
- 631 READING SEMINAR IN MODERN EUROPEAN HISTORY TO 1815** 4 credits  
Study of historical literature, sources of materials, major interpretations of early modern Europe history to Napoleonic era.
- 632 WRITING SEMINAR IN MODERN EUROPEAN HISTORY TO 1815** 4 credits  
Prerequisite: 631. Research and writing in selected topics of early modern European history, occasionally including social, economic and intellectual subjects.
- 634 READING SEMINAR IN MODERN EUROPEAN HISTORY SINCE 1815** 4 credits  
Study of historical literature, sources of materials and major interpretations of modern European history since early 19th Century.
- 635 WRITING SEMINAR IN MODERN EUROPEAN HISTORY SINCE 1815** 4 credits  
Prerequisite: 634. Research and writing in selected topics of modern European history, occasionally including social, economic and intellectual subjects.
- 640 READING SEMINAR IN HISTORY OF SCIENCE** 4 credits  
Study of historical literature, sources of materials and major interpretations in history of science.
- 641 WRITING SEMINAR IN HISTORY OF SCIENCE** 4 credits  
Research and writing in selected topics in history of science.
- 651 READING SEMINAR IN THE HISTORY OF ENGLAND AND THE EMPIRE** 4 credits  
Study of historical literature, sources of materials and major interpretations of English and British imperial history.
- 652 WRITING SEMINAR IN THE HISTORY OF ENGLAND AND THE EMPIRE** 4 credits  
Prerequisite: 651. Research and writing in selected topics of English and British imperial history.
- 666 READING SEMINAR IN AMERICAN HISTORY TO 1877** 4 credits  
Study of historical literature, sources of materials and major interpretations of American colonial and United States history to Civil War.
- 667 WRITING SEMINAR IN AMERICAN HISTORY TO 1877** 4 credits  
Prerequisite: 666. Research and writing in selected topics of American history from colonial period to Civil War.
- 669 READING SEMINAR IN AMERICAN HISTORY SINCE 1877** 4 credits  
Study of historical literature, sources of materials and major interpretations of United States history since Civil War.
- 670 WRITING SEMINAR IN AMERICAN HISTORY SINCE 1877** 4 credits  
Prerequisite: 669. Research and writing in selected topics of United States history since Civil War.
- 677 READING SEMINAR IN LATIN AMERICAN HISTORY** 4 credits  
Prerequisite: two courses in Latin American studies or permission of instructor. Study of historical literature, sources of materials and major interpretations of Latin American history.
- 678 WRITING SEMINAR IN LATIN AMERICAN HISTORY** 4 credits  
Prerequisite: 677. Research and writing in selected topics in social, cultural, diplomatic, intellectual and political history of Latin America.
- 680 READING SEMINAR: CHINA** 4 credits  
Study of Chinese texts, secondary literature, and major interpretations of the history of China.

- 681 WRITING SEMINAR: CHINA** 4 credits  
Preparation of research paper, including a bibliographic essay surveying scholarship on the topic, research and analysis of primary sources, and writing.
- 689 HISTORIOGRAPHY** 3 credits  
Study of historians, historical writings and interpretations through the ages. Required for master's degree if candidate has not had equivalent undergraduate or graduate course elsewhere.
- 690 HISTORY TEACHING PRACTICUM** 3 credits  
Prerequisite: graduate assistantship. Required of all graduate assistants each fall semester. Training and experience in college teaching of history under the supervision of an experienced faculty member. Credits may not be used to meet degree requirements.
- 694 THESIS RESEARCH** 3 credits  
Research for Master of Arts degree thesis.
- 697B INDIVIDUAL READING FOR M.A. STUDENT** 1-4 credits each  
(May be repeated for a total of 12 credits) Directed reading to fit individual student programs. May be repeated, but no more than six credits may count toward the M.A. degree in history. Written permission of the instructor required.
- 699 MASTER'S THESIS** 3 credits  
Prerequisite: 694. Writing of Master of Arts degree thesis.
- 797B INDIVIDUAL READING FOR Ph.D. STUDENT** 1-6 credits each  
(May be repeated, but no more than 12 credits may apply toward the Ph.D. in history) Directed reading to fit individual student programs. Written permission of the instructor required.
- 898 DISSERTATION RESEARCH** 1-12 credits  
Research for Doctor of Philosophy degree dissertation.
- 899 DOCTORAL DISSERTATION** 1-12 credits  
Prerequisite: 898. Writing of Doctor of Philosophy degree dissertation.

## MATHEMATICS

### 3450:

- 501 HISTORY OF MATHEMATICS** 3 credits  
Prerequisite: 222. Origin and development of mathematical ideas. Course does not meet degree requirements in the department.
- 510 ADVANCED LINEAR ALGEBRA** 3 credits  
Prerequisite: 317. Study of vector spaces, linear transformation, canonical and quadratic forms, inner product spaces.
- 511 ABSTRACT ALGEBRA I** 3 credits  
Prerequisite: 307 or permission. Study of groups, rings, fields, integral domains, vector spaces, field extensions. Galois theory.
- 512 ABSTRACT ALGEBRA II** 3 credits  
Prerequisite: 411/511 or permission of instructor. Study of groups, rings, fields, integral domains, vector spaces, field extensions, Galois theory.
- 513 THEORY OF NUMBERS** 3 credits  
Prerequisite: 222 or permission. Euclidean algorithm, unique factorization theorem, congruences, primitive roots, indices, quadratic residues, number-theoretic functions, Gaussian integers and continued fractions.
- 514 VECTOR ANALYSIS** 3 credits  
Prerequisite: 223. Vector algebra, calculus of scalar-vector, vector-scalar, vector-vector functions; integral theorems; orthogonal and general curvilinear. Application of geometry and engineering.
- 515 COMBINATORICS AND GRAPH THEORY** 3 credits  
Prerequisite: 222 or permission. Introduction to basic ideas and techniques of mathematical counting, properties of structure of systems.
- 521.2 ADVANCED CALCULUS I AND II** 3 credits each  
Sequential. Prerequisite: 223; 307 is highly recommended. Real number system, sequences, series, set theory, continuity, differentiation, integration, partial derivatives, multiple integration, maxima and minima, convergence and uniform convergence, power series, improper integrals, transformations, line and surface integrals.
- 525 COMPLEX VARIABLES** 3 credits  
Prerequisite: 223. Complex variables; elementary functions, differentiation and analytic functions; integration and Cauchy's theorem; power series and Laurent series; residue theorem; applications such as conformal mappings, inversion of integral transform.
- 527 INTRODUCTION TO NUMERICAL ANALYSIS** 3 credits  
Prerequisites: 223 and 3460:201 or knowledge of FORTRAN. Mathematical analysis of numerical methods for solving equations, interpolating function values, approximating derivatives and integrals, approximating functions.
- 528 NUMERICAL LINEAR ALGEBRA** 3 credits  
Prerequisites: 223 and 3460:201 or knowledge of FORTRAN. Mathematical analysis of numerical methods for solving systems of linear equations, eigen value problems, nonlinear systems, linear least square problems.
- 529 NUMERICAL SOLUTIONS FOR ORDINARY DIFFERENTIAL EQUATIONS** 3 credits  
Prerequisite: 427/527. Mathematical analysis of numerical methods for solving ordinary differential equations. Runge-Kutta and linear multistep methods for initial value problems. Shooting, collocation and difference methods for boundary value problems.
- 530 NUMERICAL SOLUTIONS FOR PARTIAL DIFFERENTIAL EQUATIONS** 3 credits  
Prerequisite: 428/528 or equivalent. For advanced undergraduate and graduate students. The study of finite difference and finite element methods for partial differential equations – consistency, stability, convergence and computer implementation.
- 531 SPECIAL FUNCTIONS AND OPERATIONAL CALCULUS** 3 credits  
Prerequisite: 235 or 335. Series solutions to differential equations; Bessel functions; orthogonal polynomials; self-adjoint boundary value problems and Fourier series; Laplace transforms; Fourier transforms.
- 532 PARTIAL DIFFERENTIAL EQUATIONS** 4 credits  
Prerequisite: 235 or 335. The classical initial value and boundary value problems of mathematical physics developed and solved using Fourier series and integral transforms.
- 535 SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS** 3 credits  
Prerequisites: 235 or 335 and either 312 or 428 or permission. Analysis, solution of systems of equations, linear, nonlinear. Topics: stability theory, perturbation methods, asymptotic methods, applications from physical, social sciences.
- 536 MATHEMATICAL MODELS** 3 credits  
Prerequisite: 235 or 335, and six-hour sequence in an approved applied area, or permission. Formulation and analysis of mathematical models in social and physical sciences. Analysis of deterministic and stochastic models. Topics may include stochastic processes, linear programming, graph theory, theory of measurement.
- 538 ADVANCED ENGINEERING MATHEMATICS I** 3 credits  
Prerequisites: 235 and 312 or permission. Matrices, eigenvalue problems, systems of ODEs, vector analysis, complex variables.
- 539 ADVANCED ENGINEERING MATHEMATICS II** 3 credits  
Prerequisites: 235 and 312 or permission. Special functions, Fourier series and transforms, PDEs.
- 541 CONCEPTS IN GEOMETRY** 4 credits  
Prerequisite: 222 or permission of instructor; 307 is recommended. Axiomatic treatment of both Euclidean and non-Euclidean geometries. Other concepts included are finite geometry, transformations, constructions and inversions.
- 542 PROJECTIVE GEOMETRY** 3 credits  
Prerequisite: 222 or permission. Complex projective planes, duality, homogeneous coordinate, 1-1 correspondence, cross ratios, harmonic ranges, conics, quadrilaterals, quadrangles, applications to Euclidean geometry, quadric surfaces.
- 545 INTRODUCTION TO TOPOLOGY** 3 credits  
Prerequisite: 307 or permission of instructor. Introduction to topological spaces and topologies, mapping, cardinality, homeomorphisms, connected spaces, metric spaces.
- 589 TOPICS IN MATHEMATICS** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: Permission of instructor. Selected topics in mathematics and applied mathematics at an advanced level.
- 591 WORKSHOP IN MATHEMATICS** 1-3 credits  
(May be repeated) Group studies of special topics in mathematics and statistics. May not be used to meet undergraduate or graduate major requirements in mathematics and statistics. May be used for elective credit only.
- 601 INTRODUCTION TO ANALYSIS** 4 credits  
Prerequisite: permission. An introduction to analysis to include differentiation and integration, maxima and minima, Lagrangian multipliers, transformations, infinite series, line and surface integrals, improper integrals. May not be used to meet degree requirements for mathematical sciences majors.
- 611 TOPICS IN ALGEBRA** 3 credits  
Prerequisite: 412/512. Advanced study of selected topics in some of the following areas: semi-groups, groups, rings, modules and fields.
- 621 REAL ANALYSIS** 3 credits  
Prerequisite: 422/522 or permission. In-depth study of real analysis – metric spaces, normed vector spaces, integration theory, Hilbert spaces.
- 622 MEASURE THEORY** 3 credits  
Prerequisite: 621. Measure, measurable function, Lebesgue integral, convergence theorems,  $L_p$ -spaces, Radon-Nikodym theorem.
- 625 ANALYTIC FUNCTION THEORY** 3 credits  
Prerequisite: 422/522. Complex number system, holomorphic functions, continuity, differentiability, power series complex integration, residue theory, singularities, analytic continuation, asymptotic expansion.
- 627B ADVANCED NUMERICAL ANALYSIS I AND II** 3 credits each  
Sequential. Prerequisite: 422/522. Theoretical analysis of numerical methods in linear algebra, polynomial interpolation and approximation, integration and ordinary differential equations.
- 629.30 MATRIX COMPUTATIONS I AND II** 3 credits each  
Prerequisite: 422/522 or permission. Sequential. This course is a treatment of numerical linear algebra based on the principles of scientific computing.
- 631 CALCULUS OF VARIATIONS** 3 credits  
Prerequisite: 235 or 335. Problems with fixed and movable endpoints, problems with constraints, generalization to several variables, the maximality principle, linear time-optimal problems, the connective between classical theory and the maximality principle.
- 632 ADVANCED PARTIAL DIFFERENTIAL EQUATIONS** 3 credits  
Prerequisite: 432/532 or permission. Existence, uniqueness and stability of solutions to general classes of partial differential equations. Methods for solving these classes introduced, emphasizing both analytical and numerical techniques.
- 633.4 METHODS OF APPLIED MATHEMATICS I AND II** 3 credits each  
Prerequisites: 421/521 or 438/538, 439/539 or permission. Methods of applied mathematics concentrating on techniques for analysis of differential and integral equations – applied complex analysis, integral transforms, partial differential equations, and integral equations.
- 635 OPTIMIZATION** 3 credits  
Prerequisite: 422/522 or permission. Unconstrained and constrained optimization theory and methods in applied problems.
- 636 ADVANCED COMBINATORICS AND GRAPH THEORY** 3 credits  
Prerequisite: 235 or 335. Theory and techniques of combinatorics as applied to network problems and graph theoretic problems.
- 642 DIFFERENTIAL GEOMETRY** 3 credits  
Prerequisite: 422/522. Analytic representation of space curves, surfaces; intrinsic geometry of surface; geometry of surfaces in large.
- 645 TOPOLOGY** 3 credits  
Prerequisite: 422/522. Set theory, ordinal and cardinal numbers, topological spaces, filters and nets, separation, coverings, metric spaces, homotopy, related topics.
- 689 ADVANCED TOPICS IN MATHEMATICS** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: permission of advisor. Seminar-type discussion on topics in mathematics leading to supervised research project. No more than 2 credits apply to major requirements.
- 692 SEMINAR IN MATHEMATICS** 1-3 credits  
(May be repeated) Prerequisite: permission of advisor. Seminar-type discussion on topics in mathematics leading to supervised research project. No more than 2 credits apply to major requirements.
- 695 PRACTICUM IN MATHEMATICS AND STATISTICS** 1-3 credits  
(May be repeated) Prerequisite: graduate teaching assistant or permission. Training and experience in college teaching of mathematical sciences. May not be used to meet degree requirements. May be taken only on a credit/noncredit basis.
- 697 INDIVIDUAL READING** 1-2 credits  
(May be repeated for a total of four credits) Prerequisites: graduate standing and permission. Directed studies in mathematics at graduate level under guidance of selected faculty member.

- 698 MASTER'S RESEARCH** 1-6 credits  
(May be repeated) Prerequisite: permission of advisor. Research in suitable topics in mathematics or applied mathematics culminating in a research paper. No more than 2 credits applicable to major requirements.
- 699 MASTER'S THESIS** 2 credits  
(May be repeated for a total of four credits) Prerequisite: permission. Properly qualified candidate for master's degree may obtain four credits for research experience which culminates in presentation of faculty-supervised thesis.
- 721.2 FUNCTIONAL ANALYSIS I AND II** 3 credits each  
Prerequisites: 410/510 and 621. These courses are sequential. Study of normed linear spaces and transformations between them with an emphasis on the formulation and analysis of differential and integral equations as operator equations on these spaces.
- 726 APPROXIMATION THEORY** 3 credits  
Prerequisites: 422/522 and 525 or equivalent. Analytical and numerical approximation of functions and other mathematical quantities which are either difficult or impossible to compute, or which defy reasonable representation.
- 728 MATRIX ITERATIVE ANALYSIS** 3 credits  
Prerequisite: 312 or permission of the instructor. Basic iterative methods, Matrix Properties and Concepts, Linear and Nonlinear equation solver, Semi-iterative and conjugate-gradient methods.
- 730 ADVANCED NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS** 3 credits  
Prerequisites: 422/522 and 428/528, or 628, or equivalent. Derivation, analysis, and implementation of difference and variational-based methods for the solution of partial differential equations and systems of differential equations.
- 731.2 ADVANCED PARTIAL DIFFERENTIAL EQUATIONS I AND II** 3 credits each  
Prerequisites: 422/522 and 432/532 or equivalent. Well-posedness of elliptic, hyperbolic and parabolic problems. Variational Methods for Elliptic problems, Conservation Laws and numerical methods, potential theory and integral equations.
- 733.4 ASYMPTOTIC METHODS AND NONLINEAR ANALYSIS I AND II** 3 credits each  
Prerequisites: 633/634 or equivalent. Survey of asymptotic and perturbation methods as applied to integrals and differential equations. Topics: bifurcation and stability with applications from the physical sciences and engineering.
- 735 DYNAMICAL SYSTEMS** 3 credits  
Prerequisite: 422/522 or equivalent. The study of mathematical models of systems which evolve over time. An introduction to maps and applications to ordinary differential equations.
- 736 DISTRIBUTION THEORY** 3 credits  
Prerequisites: 621 and 634 or equivalent. Study of the theory of distributions and its applications. Topics: basic concepts, distributional calculus, Fourier and Laplace transforms theory, function space theory, and applications to partial differential equations.
- 737 THEORY OF TRANSFORMS** 3 credits  
Prerequisites: 425/525 and 621 or equivalent. The theory of continuous and discrete transforms, including Laplace, Fourier, Hartley and other transforms, as well as fast implementations. The theory of wavelets is a major topic.
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- ## COMPUTER SCIENCE
- ### 3460:
- 501 FUNDAMENTALS OF DATA STRUCTURES** 3 credits  
Prerequisite: programming experience in C. Basic data structures and algorithms: stacks, queues, linked lists, trees, hash tables, and graphs; sorting and search algorithms. Introduction to data abstraction and algorithm analysis. (Not an approved major, minor, or certificate elective in computer science.)
- 506 INTRODUCTION TO C AND UNIX** 3 credits  
Prerequisite: Programming experience. C language programming, UNIX shell programming, file structure, system calls, and interprocess communication. (Not an approved mathematical sciences major, minor, or certificate elective.)
- 508 WINDOWS PROGRAMMING** 3 credits  
Prerequisites: 208 or 210 or 406 or 506 or permission. Windows operating systems, integrated development environment, event-driven programming, graphical user interface design, using object libraries, component object model, object linking and embedding, client-server objects.
- 518 INTRODUCTION TO DISCRETE STRUCTURES** 3 credits  
Prerequisite: 210 or permission. Introduction to a number of structures in algebra of particular use to student in computer science. Topics include algorithms and flow chart language, graphs and digraphs, trees, lattices codes.
- 520 STRUCTURED PROGRAMMING** 3 credits  
Prerequisites: 316 and 418/518. Techniques of block programming using a structured programming language, program readability, program verification and program design.
- 521 INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING** 3 credits  
Prerequisite: 316. Object-oriented design, analysis, and programming using different development models. Comparison with other programming paradigms.
- 526 OPERATING SYSTEMS** 3 credits  
Prerequisites: 306 and 316, or 501 or equivalent. Introduction to various types of operating systems: batch processing systems, multiprogramming systems and interacting processes; storage management; process and resource control; deadlock problem. Course is independent of any particular operating system.
- 528 UNIX SYSTEM PROGRAMMING** 3 credits  
Prerequisites: 316 and knowledge of C. An overview of the UNIX operating system. Shell programming. Process management, processor management, storage management, scheduling algorithms, resource protection, and system programming.
- 530 THEORY OF PROGRAMMING LANGUAGES** 3 credits  
Prerequisite: 316. Advanced concepts underlying programming languages and their applications, formal definitions of programming languages, Backus Normal Form, semantics. Alternative programming paradigms including functional programming.
- 535 ANALYSIS OF ALGORITHMS** 3 credits  
Prerequisites: 316 and 418/518. Design and analysis of efficient algorithms for random access machines; derivation of pattern classification algorithms.
- 540 COMPILER DESIGN** 3 credits  
Prerequisites: 307 and 316. Techniques used in writing and modifying compilers including translation, loading, execution, symbol tables and storage allocation; compilation of simple expressions and statements. Organization of a compiler for handling lexical scan, syntax scan, object code generation, error diagnostics and code optimization. Use of compiler writing languages and bootstrapping. The course requires a project involving compiler writing.
- 555 DATA COMMUNICATIONS AND COMPUTER NETWORKS** 3 credits  
Prerequisites: 210 and knowledge of C. ISO-OSI, TCP/IP, SNA data switching, protocols, flow and error control, routing, topology. Network trends, network taxonomies, and socket-based programming.
- 557 COMPUTER GRAPHICS** 3 credits  
Prerequisites: 316 and knowledge of C. Topics in vector graphics, scan line graphics, representations and languages for graphics.
- 560 ARTIFICIAL INTELLIGENCE AND HEURISTIC PROGRAMMING** 3 credits  
Prerequisite: 316. Study of various programs which have displayed some intelligent behavior. Exploration of level at which computers can display intelligence.
- 565 COMPUTER ORGANIZATION** 3 credits  
Prerequisite: 306. An introduction to the hardware organization of the computer at the register, processor and systems level. An in-depth study of the architecture of a particular computer systems family.
- 567 MICROPROCESSOR PROGRAMMING AND INTERFACING** 3 credits  
Prerequisites: 306, 316. Detailed study of a particular microprocessor architecture and instruction set. Standard device interface components. Real time programming concepts.
- 570 AUTOMATA, COMPUTABILITY AND FORMAL LANGUAGES** 3 credits  
Prerequisite: 418/518. Presentation of theory of formal languages and their relation to automata. Topics include description of languages; regular context-free and context-sensitive grammar; finite, pushdown and linear-bounded automata; turning machines; closure properties; computational complexity, stack automata and decidability.
- 575 DATABASE MANAGEMENT** 3 credits  
Prerequisite: 316. Fundamentals of database organization, data manipulations and representation, data integrity, privacy.
- 577 INTRODUCTION TO PARALLEL PROCESSING** 3 credits  
Prerequisites: 316 and knowledge of C. Commercial processors: past and present. Parallel languages, models of parallel computation. Emphasis on parallel algorithm design and performance evaluation. A broad study of parallel paradigms with relation to real world applications.
- 589 TOPICS IN COMPUTER SCIENCE** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: permission of instructor. Selected topics in computer science at an advanced level.
- 591 WORKSHOP IN COMPUTER SCIENCE** 1-3 credits  
Group studies of special topics in computer science. May not be used to meet graduate or undergraduate requirements in mathematics, statistics or computer science.
- 597 INDIVIDUAL READING IN COMPUTER SCIENCE** 1-3 credits  
(May be repeated) Prerequisite: permission. Computer science major only. Directed studies designed as introduction to research problems, under guidance of designated faculty members.
- 610 SYMBOLIC AND NUMERICAL METHODS** 3 credits  
Prerequisite: 3450/223 (and 3450/312 or 428/528, or 410/510) and (3460/330 or knowledge of LISP). Computer applications of symbolic methods using an advanced symbol manipulation language (MACSYMA). LISP-level programming for MACSYMA. Theoretical and practical aspects of combining symbolic and numerical methods.
- 626 ADVANCED OPERATING SYSTEMS** 3 credits  
Prerequisite: 426/526 or equivalent. Advanced topics in operating system design: synchronization mechanisms, performance evaluation, security, distributed operating systems.
- 635 ADVANCED ALGORITHMS AND COMPLEXITY THEORY** 3 credits  
Prerequisite: 435/535 or equivalent. Advanced graph algorithms, matrix multiplication, fast Fourier transforms, lower bound theory, complexity hierarchies, NP-complete and intractable problems, approximation techniques.
- 640 ADVANCED COMPILER DESIGN AND CONSTRUCTION** 3 credits  
Prerequisite: 440/540 or equivalent. Continuation of 440/540. Theory of LL(k) and LR(k) parsing, compiler writing tools and environments, code optimization, implementation of advanced language features. Major programming project required.
- 655 COMPUTER NETWORKS AND DISTRIBUTED PROCESSING** 3 credits  
Prerequisites: 465/565 and 455/555. Interconnection technologies, protocol layering models, datagram and stream transport services, client-server paradigm, principles and protocols of interconnected networks operating as unified systems, and TCP/IP technology.
- 657 ADVANCED COMPUTER GRAPHICS** 3 credits  
Prerequisites: 457/557 knowledge of C and UNIX. Topics include 3D viewing and projections, image manipulation, 3D transformations, color shading, clipping and animation via raster files, fractal mapping, surface rendering, and solid mapping.
- 658 VISUALIZATION** 3 credits  
Prerequisite: 457 or 557 or permission of instructor. Visualization pipeline, data representation in visualization, visualization algorithms, object-oriented visualization, scientific visualization, volume visualization, visualization applications and research topics.
- 660 EXPERT SYSTEMS** 3 credits  
Prerequisite: 460/560 or maturity in mathematics. Architecture of expert systems, knowledge representation and acquisition, inference mechanisms for expert systems, uncertainty management, expert system tools and applications.
- 665 ADVANCED COMPUTER ARCHITECTURE** 3 credits  
Prerequisite: 465/565 or equivalent. Fundamentals of computer analysis and design, with emphasis on cost/performance tradeoffs. Studies of pipelined, vector, RISC, and multiprocessor architectures.
- 670 ADVANCED AUTOMATA AND COMPUTABILITY** 3 credits  
Prerequisite: 470/570 or equivalent. An in-depth study of concepts related to computability. Topics include nondeterministic automata, recursive function theory, the Chomsky hierarchy, Turing machines and undecidability.
- 675 ADVANCED DATABASE MANAGEMENT** 3 credits  
Prerequisite: 475/575 or equivalent. Relational database theory, including formal query languages; query processing and optimization techniques; reliability techniques including recovery, concurrency, security, and integrity; current trends in database technology.
- 677 PARALLEL PROCESSING** 3 credits  
Prerequisite: 477/577. Advanced computer architectures, theories of parallel computing, system resources optimization, efficient programming languages and application requirements of cost-effective computer systems. Classical results and practical insights into implementing parallel algorithms on actual parallel machines.
- 680 SOFTWARE ENGINEERING** 3 credits  
Prerequisites: 307 and 316. Introduction to current techniques and methodologies used in software design, development, validation, and maintenance.
- 689 ADVANCED TOPICS IN COMPUTER SCIENCE** 1-3 credits  
(May be repeated) Prerequisite: permission of instructor. At most, six credits may be applied to degree requirements. Selected topics in computer science at an advanced level.
- 692 SEMINAR IN COMPUTER SCIENCE** 1-3 credits  
(May be repeated) Prerequisite: permission of advisor. Seminar-type discussions on topics in computer science. No more than two credits apply to major requirements.

- 695 PRACTICUM IN COMPUTER SCIENCE** 1-3 credits  
Prerequisite: graduate teaching assistant or permission. Training and experience in college teaching of computer science under the supervision of an experienced faculty member. May not be used to meet degree requirements. May be taken only on a credit/non-credit basis.
- 698 MASTER'S RESEARCH** 1-6 credits  
(May be repeated) Prerequisite: permission of advisor. Research in suitable topics in computer science culminating in a research paper. No more than two credits applicable to major requirements.
- 699 MASTER'S THESIS** 2 credits  
Prerequisite: permission. (May be repeated for a total of four credits.) A properly qualified candidate for a master's degree may obtain 2-4 credits for research experience which culminates in presentation of a faculty-supervised thesis.
- 710 ADVANCED COMPUTING TECHNIQUES IN PHYSICAL SCIENCES** 3 credits  
Prerequisites: Programming experience in FORTRAN; 3450.427/527 or 428/528 or 627; a knowledge of the UNIX operating system. Introduction to current trends and techniques in scientific computing. Topics include numerical software design, symbolic computation, and parallel computing.

## STATISTICS

### 3470:

- 515 MATHEMATICAL CONCEPTS FOR STATISTICS** 4 credits  
Prerequisites: 3450.223, 3450.312, or equivalent. Topics from matrix algebra and analysis: quadratic forms, eigenvalues and roots, generalized inverses, vector functions, continuity, differentiation, extreme problems, multivariate integration, infinite series, and application. May not be used to meet graduate degree requirements for mathematical sciences majors.
- 550 PROBABILITY** 3 credits  
Prerequisite: 3450.221. Introduction to probability, random variables and probability distributions, expected value, sums of random variables, Markov processes.
- 551.2 THEORETICAL STATISTICS I AND II** 3 credits each  
Sequential. Prerequisite: 3450.223. Elementary combinatorial probability theory, probability distributions, mathematical expectation, functions of random variables, sampling distributions, point and interval estimation, tests of hypotheses, regression and correlation, introduction to experimental designs.
- 560 STATISTICAL METHODS** 4 credits  
Application of statistical methods to the social sciences including description statistics, probability distributions, statistical inference (parametric, nonparametric), categorical data analysis, linear regression, correlation, computer applications. May not be used to meet Mathematical Sciences degree requirements.
- 561 APPLIED STATISTICS I** 4 credits  
Prerequisite: 3450.222 or 216 or equivalent. Applications of statistical theory to natural and physical sciences and engineering, including probability distributions, interval estimation, hypotheses testing (parametric and nonparametric), and simple linear regression and correlation.
- 562 APPLIED STATISTICS II** 4 credits  
Prerequisite: 461/561 or equivalent. Applications of the techniques of regression and multifactor analysis of variance.
- 565 DESIGN OF SAMPLE SURVEYS** 3 credits  
Prerequisite: 461/561 or equivalent. Design and analysis of frequently used sample survey techniques.
- 569 RELIABILITY MODELS** 3 credits  
Prerequisite: 461/561. Selected topics in reliability modeling including parametric and nonparametric models, competing modes of failure, censored data and accelerated life models.
- 571 ACTUARIAL SCIENCE I** 3 credits  
Prerequisite: 551 or 561 or equivalent. Study of various statistical, financial, and mathematical calculations used to determine insurance premiums related to contingent risks based on individual risk model frameworks.
- 572 ACTUARIAL SCIENCE II** 3 credits  
Prerequisite: 471/571. Continuation of Actuarial Science I. Study of multiple life functions, multiple decrement models, valuation theory for pension plans, insurance models including expenses, nonforfeiture benefits and dividends.
- 575 FOUNDATIONS OF STATISTICAL QUALITY CONTROL** 3 credits  
Prerequisite: 461/561 or equivalent. Course provides a solid foundation in the theory and applications of statistical techniques widely used in industry.
- 580 STATISTICAL COMPUTER APPLICATIONS** 3 credits  
Prerequisites: 3450.222 and one semester course in statistics or permission. Translation of statistical operations into computer languages, iterative procedures, generating data, Monte Carlo techniques, use of statistical packages.
- 589 TOPICS IN STATISTICS** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: permission. Selected topics in advanced statistics, including quality control, reliability, sampling techniques, decision theory, advanced inference, stochastic processes and others.
- 591 WORKSHOP IN STATISTICS** 1-3 credits  
(May be repeated with change of topic) Group studies of special topics in statistics. May not be used to meet undergraduate or graduate major requirements in mathematics and statistics. May be used for elective credit only.
- 595 STATISTICAL CONSULTING** 1-3 credits  
Prerequisite: 480/580 or permission. Students will be assigned to work with an instructor on current projects in the Center for Statistical Consulting. May be repeated for a total of 4 credits; however, only 2 credits will count toward major requirements. Does not count for elective credit for math science department majors.
- 650 ADVANCED PROBABILITY AND STOCHASTIC PROCESSES** 3 credits  
Prerequisite: 651. Random walk, distributions, unlimited sequence of trials, laws of large numbers, convolutions, branching processes, renewal theory, Markov chains, time-dependent stochastic processes.
- 651 PROBABILITY AND STATISTICS** 4 credits  
Prerequisites: 3450.521/522 or 515 or equivalent. Probability, random variables, moments and generating functions, random vectors, special distributions, limit theorems, sampling, point estimation, hypothesis testing, confidence estimation.
- 652 ADVANCED MATHEMATICAL STATISTICS** 3 credits  
Prerequisite: 651. Convergence of random variables, the Central Limit Theorem; theory of estimation; theory of hypothesis testing; the multivariate normal density; introduction to linear models; Bayesian statistics.

- 655 LINEAR MODELS** 3 credits  
Prerequisites: 3450.312 and 651 or equivalent. General linear model in matrix notation, general linear hypothesis, regression models, experimental design models, analysis of variance and covariance, variance components.
- 660 ADVANCED STATISTICAL METHODS** 4 credits  
Prerequisite: 560 or 561 or 664 or equivalent. Theory and applications of the techniques of regression and multifactor analysis of variance.
- 663 EXPERIMENTAL DESIGN** 3 credits  
Prerequisite: 561 or equivalent. Selected topics in experimental design including random and fixed effects, nested designs, split plot designs, confounding, fractional factorials, Latin squares, and analysis of covariance.
- 664 STATISTICS FOR THE HEALTH SCIENCES** 4 credits  
(May not be used to meet degree requirements for mathematical sciences majors) Prerequisite: college-level algebra or equivalent. Descriptive statistics, probability and probability distribution, tests of hypotheses and confidence intervals, nonparametric statistics, regression and correlation.
- 665 REGRESSION** 3 credits  
Prerequisite: 561 or equivalent. Correlation, simple and multiple linear regression: least squares, matrix notation, model building and checking estimation, hypothesis testing, outliers, influence, multicollinearity, transformations, categorical regressors; logistic regression.
- 666 NONPARAMETRIC STATISTICS-METHODS** 3 credits  
Prerequisite: 560 or 561 or equivalent. Theory and practice using techniques requiring less restrictive assumptions. Nonparametric analogues to t- and F-tests, ANOVA, regression and correlation. Computer applications.
- 667 FACTOR ANALYSIS** 3 credits  
Prerequisite: 560 or 561 or 664. Theory and techniques for identifying variables through use of principal components and factor analysis. Identification of groups using cluster analysis. Computer applications.
- 668 MULTIVARIATE STATISTICAL METHODS** 3 credits  
Prerequisite: 562 or 663 or 665 or equivalent. Multivariate techniques including distance concept, Hotelling T<sup>2</sup>, multivariate ANOVA, regression and correlation, linear contrasts, factorial experiments, nested and repeat measure designs, Bonferroni X<sup>2</sup> tests, linear discrimination analysis, canonical correlations, application.
- 670 BIostatISTICS** 3 credits  
Prerequisite: 561 or 664 or equivalent. Statistical issues and methods for biological, medical and health sciences including: clinical trials, sample size, power, log-linear models, survival analysis, and bioassay. Computer applications.
- 675 RESPONSE SURFACE METHODOLOGY** 3 credits  
Prerequisite: 562 or 663 or 665 or equivalent. First and second order response designs, efficient experimental plans, methods for the analysis, and optimization of response functions.
- 689 ADVANCED TOPICS IN STATISTICS** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: 651. Selected topics in statistics including concepts in order, statistics, advanced inference, sequential analysis, stochastic processes, reliability theory, Bayesian statistics and regression.
- 692 SEMINAR IN STATISTICS** 1-3 credits  
(May be repeated) Prerequisite: permission of advisor. Seminar-type discussion on topics in statistics leading to supervised research project. No more than 2 credits apply to major requirements.
- 695 PRACTICUM IN STATISTICS AND MATHEMATICS** 1-3 credits  
Prerequisite: graduate teaching assistant or permission. Training and experience in college teaching of statistics. May not be used to meet degree requirements. May be taken only on a credit/non-credit basis.
- 697 INDIVIDUAL READING** 1-2 credits  
(May be repeated for a total of four credits) Prerequisites: graduate standing and permission. Directed studies in statistics under guidance of selected faculty member.
- 698 MASTER'S RESEARCH** 1-6 credits  
(May be repeated) Prerequisite: permission of advisor. Research in suitable topics in statistics culminating in a research paper. No more than 2 credits applicable to major requirements.
- 699 MASTER'S THESIS** 2 credits  
(May be repeated for a total of 4 credits) Prerequisite: Permission. Properly qualified candidates for master's degree may obtain 2-4 credits for research experience which culminates in presentation of faculty-supervised thesis.

## ENGINEERING APPLIED MATHEMATICS

### 3490:

- 701.2 INTERDISCIPLINARY RESEARCH SEMINAR** 3 credits each  
Prerequisite: Permission. For students seeking graduate degrees in Applied Mathematics. An introduction to applied mathematics research in the mathematical sciences, physical sciences, and engineering.
- 790 ADVANCED SEMINAR IN APPLIED MATHEMATICS** 1-4 credits  
Prerequisite: Permission. (May be repeated for a total of 12 credits.) For students seeking graduate degrees in Applied Mathematics. Advanced projects and studies in various areas of applied mathematics.
- 898 PRELIMINARY RESEARCH** 1-15 credits  
Prerequisite: Permission. (May be repeated.) Completion of qualifying examination and approval of Student Advisory Committee. Preliminary investigation of Ph.D. dissertation topic.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
Prerequisite: Permission. (May be repeated.) Completion of Candidacy examination and approval of Student Advisory Committee. Original research by a Ph.D. candidate.

## MODERN LANGUAGES

### 3500:

- 590 WORKSHOP** 2 credits  
(May be repeated) Group studies of special topics in modern languages.

**FRENCH****3520:**

- 502 ADVANCED FRENCH GRAMMAR** 3 credits  
Prerequisite: 302 or equivalent. Advanced study of normative French grammar with emphasis on syntax, morphology, grammatical structure and phonetic principles.
- 507 FRENCH LITERATURE OF THE MIDDLE AGES AND THE RENAISSANCE** 4 credits  
Prerequisite: 305 or 306 or equivalent. Reading and discussion of selected Medieval and Renaissance literary works. Conducted in French.
- 511 17TH CENTURY FRENCH LITERATURE** 4 credits  
Prerequisite: 305 or 306 or equivalent. Reading and discussion of selected works in poetry, drama and novels. Conducted in French.
- 515 18TH CENTURY FRENCH LITERATURE** 4 credits  
Prerequisite: 305 or 306 or equivalent. Reading and discussion of selected authors; emphasis on the *Philosophes*. Conducted in French.
- 519 19TH CENTURY FRENCH LITERATURE** 4 credits  
Prerequisite: 305 or 306 or equivalent. Reading and discussion of selected works pertaining to romantic, realistic and naturalistic movements. Conducted in French.
- 522 SPECIAL TOPICS IN ADVANCED LANGUAGE SKILLS OR CULTURE OR LITERATURE** 1-4 credits  
Prerequisite: 202 or equivalent. (May be repeated.) Development of specialized language skills or reading of significant works of literature or culture not studied in other courses.
- 527 20TH CENTURY FRENCH LITERATURE** 4 credits  
Prerequisite: 305 or 306 or equivalent. Reading and discussion of the most representative works of period. Conducted in French.
- 529 FRANCOPHONE CARIBBEAN LITERATURE** 3 credits  
Prerequisites: 305 or 306 or equivalent. A study of selected literary works from Haiti, Guadeloupe, and Martinique in light of their geographic, historic, socioethnic, and cultural determinants.
- 560 SELECTED THEMES IN FRENCH LITERATURE** 3 credits  
(May be repeated.) Conducted in French. Prerequisite: 305 and 306 or equivalent. Reading and discussion of literary works selected according to an important theme.
- 571 FRENCH LANGUAGE READING PROFICIENCY** 4 credits  
Designed to develop proficiency in reading comprehension. Prepares students for graduate reading examination. Does not count toward French major.
- 597.8 INDIVIDUAL READING IN FRENCH** 1-4 credits  
Prerequisites: 302 and permission of the French section. Individual reading in French, offered at the graduate level. (May be repeated for a total of eight credits.)
- 603.4 ROMANCE AND APPLIED LINGUISTICS** 4 credits each  
History of French language from 842 to present. Second semester deals with application of linguistic research to teaching of French.
- 607.8 SELECTED TOPICS IN THE MOVEMENT OF IDEAS IN FRENCH LITERATURE** 4 credits each  
Study of ideas instrumental in shaping French thought and culture.
- 619.20 FRENCH CULTURE EXPRESSED IN LITERATURE** 4 credits each  
Anthropological approach emphasizing social and civic institutions, education, music and arts, value systems and national characteristics.
- 641 SEMINAR: FRANCOPHONE LITERATURE, CULTURE AND CIVILIZATION** 2 credits  
Study of various aspects of culture, civilization and literature of French expression outside of France.
- 642 SEMINAR: THE IMAGE OF THE WOMAN IN FRENCH LITERATURE** 2 credits  
Study of the woman as characterized in French literature from Middle Ages to present.
- 661 FRENCH TEACHING PRACTICUM** 2 credits  
Prerequisite: teaching assistantship or permission. Orientation and practice of particular aspects of teaching language and culture. Periodical review and evaluation. Credits may not be applied toward degree requirement.
- 697.8 INDIVIDUAL READING AND RESEARCH IN FRENCH** 1-4 credits each  
Prerequisites: 202 and permission of Department Chair. Independent study and research in specific areas. Considerable reading and writing required.
- 699 MASTER'S THESIS** 4 credits

**GERMAN****3530:**

- 519 THE AGE OF GOETHE I** 3 credits  
Prerequisite: 302 or 306 or permission. Enlightenment and generation of Sturm und Drang, including works of Wieland, Lessing, Klopstock, Herder, the young Goethe and others. Conducted in German.
- 520 THE AGE OF GOETHE II** 3 credits  
Prerequisites: 302, 306 or permission. Faust, selections from parts I and II. Ballads of Goethe and Schiller. Conducted in German.
- 522 SPECIAL TOPICS IN ADVANCED LANGUAGE SKILLS, CULTURE, AND LITERATURE** 1-4 credits  
Prerequisites: 301 and graduate standing. Development of specialized language skills; advanced readings in German literature or culture. (May be repeated for a total of eight credits.)
- 531 200 YEARS OF GERMAN DRAMA** 3 credits  
Prerequisite: 302 or 306 or permission. Representative works of major classical dramatics including Lessing, Goethe, Schiller, Kleist, Grillparzer. Conducted in German.
- 532 200 YEARS OF GERMAN DRAMA** 3 credits  
Prerequisite: 302 or 306 or permission. Representative works of the major dramatists, Buchner, Hebbel, Hauptmann and Wedekind. Conducted in German.
- 535 GERMAN SHORT STORY** 3 credits  
Prerequisite: 302 or 306 or permission. Reading and discussion of representative works of German romanticism, including those of Tieck, Kleist, E. T. A. Hoffman, Brentano, Eichendorff. Conducted in German.
- 536 GERMAN SHORT STORY** 3 credits  
Prerequisite: 302 or 306 or permission. Reading and discussion of works representative of the period, including those of Droste-Hulshoff, Stifter, Keller, Meyer, Storm. Conducted in German.

- 539 20TH CENTURY LITERATURE I** 3 credits  
Prerequisite: 302 or 306 or permission. Clash of old and the new at the turn of the century. Works of T. Mann, Hauptmann, Kaiser, Hofmannsthal, Rilke, Wedekind and others. Conducted in German.
- 540 20TH CENTURY GERMAN LITERATURE II** 3 credits  
Prerequisite: 302 or 306 or permission. Impact of modernity. Reading and discussion of writings of Hesse, Kafka, Doblin, Werfel and others. Conducted in German.
- 571 GERMAN LANGUAGE READING PROFICIENCY** 4 credits  
Designed to develop proficiency in reading comprehension.
- 597.8 INDIVIDUAL READING IN GERMAN** 1-4 credits  
Prerequisites: 301 and graduate standing. Individual reading in German, offered at the graduate level. (May be repeated for a total of eight credits.)

**SPANISH****3580:**

- 505 SPANISH LINGUISTICS; PHONOLOGY** 4 credits  
Prerequisite: permission. Descriptive study of Spanish phonetics and morphology, comparison of Spanish and English sounds, historical aspects, regional accents and sociolinguistic variation. Conducted in Spanish.
- 506 SPANISH LINGUISTICS; SYNTAX** 4 credits  
Prerequisite: permission. Descriptive study of Spanish syntax; introduction to theories of grammar; overview of Spanish semantics and pragmatics. Conducted in Spanish.
- 509 CULTURAL MANIFESTATION IN MEDIEVAL AND RENAISSANCE SPAIN** 4 credits  
Prerequisite: 407 or 408 or permission of instructor. Comparative study of representative artistic and literary works of the Medieval and Renaissance periods. Conducted in Spanish.
- 511 SPAIN DURING THE BAROQUE PERIOD** 4 credits  
Prerequisite: 407 or 408 or instructor's permission. A comparative study of the different cultural manifestations during the 17th century in Spain. Conducted in Spanish.
- 512 CERVANTES: DON QUIJOTE** 4 credits  
Prerequisite: 407 or 408 or permission of instructor. Reading and analysis of Don Quixote as the first modern novel in the historical context of Renaissance and Baroque esthetics. Conducted in Spanish.
- 515 THE AGE OF REASON AND THE ROMANTIC REBELLION IN SPAIN** 4 credits  
Prerequisite: 407 or 408 or permission. Study of the Enlightenment and the Romantic movement as reflected in the works of the major artists and writers of these periods. Conducted in Spanish.
- 516 REPRESENTING REALITY IN 19TH CENTURY SPAIN** 4 credits  
Prerequisite: 407 or 408 or permission. A comparative study of the major literary and artistic movements in Spain from Realism to Modernism. Conducted in Spanish.
- 518 20TH CENTURY SPAIN: THE AVANT-GARDE IN LITERATURE AND ART** 4 credits  
Prerequisite: 407 or 408 or permission of instructor. A comparative study of the major literary and artistic movements in Spain which illustrate the primary cultural changes of the century. Conducted in Spanish.
- 519 THE SPANISH CIVIL WAR AND ITS CULTURAL IMPACT** 4 credits  
Prerequisite: 305 or permission of instructor. Study of the impact of the Civil War on Spanish culture.
- 522 SPECIAL TOPICS IN SPECIALIZED LANGUAGE SKILLS OR CULTURE OR LITERATURE** 1-4 credits  
Prerequisite: 202 or equivalent. (May be repeated.) Development of specialized language skills or reading of significant works of literature or culture not studied in other courses.
- 523 SPANISH-AMERICAN LITERATURE BEFORE 1900** 4 credits  
Prerequisite: 407 or 408 or permission. Reading of representative Spanish-American literature from the discovery to 1900. Oral and written reports. Conducted in Spanish.
- 524 RACE AND ETHNICITY: INDIGENOUS CULTURES IN 20TH CENTURY SPANISH-AMERICA** 4 credits  
Prerequisite: 407 or 408 or permission. Traces the diverse representations of indigenous cultures in literature. Takes into account the interactive forces of class, gender, race, and ethnic difference. Conducted in Spanish.
- 525 20TH CENTURY SPANISH-AMERICAN NOVEL** 4 credits  
Prerequisite: 407 or 408 or permission of instructor. Reading and discussion of representative contemporary Latin American novels. Conducted in Spanish.
- 527 LATINO CULTURES IN THE USA** 4 credits  
Prerequisites: 407 and 408 or permission of instructor. Inquiry into the Latino experience of displacement and marginality through the analysis of cultural manifestations in the USA. Conducted in Spanish.
- 529 CULTURE AND LITERATURE OF THE HISPANIC CARIBBEAN** 4 credits  
Prerequisite: 407 or 408 or permission of instructor. Emphasis on customs, traditions and literature, including lectures, films, slides, and analysis of selected writings by contemporary Hispanic authors from the Caribbean. Conducted in Spanish.
- 530 WOMEN IN 20TH CENTURY HISPANIC LITERATURE** 4 credits  
Prerequisite: 407 or 408 or permission. Reading and analysis of selected works from the 20th Century that depict women in Hispanic countries. Methodologies of feminist criticism will be studied. Conducted in Spanish.
- 531 HISPANIC CULTURE: SPAIN** 4 credits  
Prerequisite: 302 or permission. Study of society, customs, history, art, music, etc. of Spain, from a Hispanic perspective. Conducted in Spanish.
- 532 HISPANIC CULTURE: SOUTH AMERICA** 4 credits  
Prerequisite: 302 or permission. Study of society, customs, history, art, music, etc. of South America, from a Hispanic perspective. Conducted in Spanish.
- 533 HISPANIC CULTURE: MEXICO AND CENTRAL AMERICA** 4 credits  
Prerequisite: 302 or equivalent. Study of society, history, and culture of Mexico, Central America and the Hispanic Caribbean, from a Hispanic perspective. Conducted in Spanish.
- 571 SPANISH LANGUAGE READING PROFICIENCY** 4 credits  
Designed to develop proficiency in reading comprehension.
- 601 SEMINAR ON MEDIEVAL SPANISH LITERATURE** 4 credits  
Reading and discussion on monumental medieval literary works of Spain such as Poema de Mio Cid, El Conde Lucanor, El Libro de Buen Amor. Conducted in Spanish.

- 609.10 SEMINAR ON SPANISH LITERATURE OF THE GOLDEN AGE: SEMINAR ON 18TH AND 19TH CENTURIES SPANISH LITERATURE** 4 credits each  
Reading and discussion of representative writers from Renaissance to late Baroque period. Studies in essay, novel, theatre, poetry and philosophic writings. Conducted in Spanish.
- 613 SEMINAR ON SPANISH-AMERICAN LITERATURE** 4 credits  
Studies in representative writers preceding the "Boom." Reading and discussion of various genres and authors representing significant literary developments. Conducted in Spanish.
- 617 SEMINAR ON 20TH CENTURY SPANISH-AMERICAN LITERATURE** 4 credits  
Reading and discussion of contemporary writers with emphasis on theatre, novel and short story. Conducted in Spanish.
- 621 SEMINAR ON 20TH CENTURY SPANISH LITERATURE** 4 credits  
Studies in representative present-day writers with analyses and discussions of novel, theatre, poetry and short stories. Conducted in Spanish.
- 661 SPANISH TEACHING PRACTICUM** 2 credits  
Prerequisite: teaching, assistantship or permission. Orientation and practice of particular aspects of teaching Spanish language and culture. Student teaching experiences are periodically reviewed and evaluated. These credits may not be applied toward degree requirements.
- 697.8 INDIVIDUAL READINGS IN SPANISH** 1-4 credits each  
Content of given individual reading program taken from course contests approved for graduate work in Spanish.
- 699 MASTER'S THESIS** 4 credits

## PHILOSOPHY

### 3600:

- 511 PLATO** 3 credits  
Prerequisite: 211 or permission of instructor. Detailed study of the origin and development of Plato's Theory of Forms and the related theories of knowledge, ethics, and politics.
- 518 ANALYTIC PHILOSOPHY** 3 credits  
Prerequisites: 211, 312 and 313 or permission of instructor. Study of ideal and ordinary language movements in 20th Century British and American philosophy. Deals with such figures as Russell, Carnap, Ayer, Moore, Wittgenstein, Tye and Austen.
- 519 BRITISH EMPIRICISM** 3 credits  
Prerequisites: one introductory course and 313 or permission of instructor. Intensive analysis of selected major writings of Locke, Berkeley and Hume.
- 521 PHILOSOPHY OF LAW** 3 credits  
Prerequisite: one course in philosophy or permission of instructor. Philosophical inquiry into the nature of law and legal institutions.
- 522 CONTINENTAL RATIONALISM** 3 credits  
Prerequisites: one introductory course and 313 or permission of instructor. Intensive analysis of selected major writings of Descartes, Spinoza and Leibnitz.
- 524 EXISTENTIALISM** 3 credits  
Prerequisites: one introductory course in philosophy, 314 or permission of instructor. In-depth inquiry into the thought of Kierkegaard, Jaspers, Heidegger, Sartre, Tillich and other existentialists with their concern for the human condition.
- 526 PHENOMENOLOGY** 3 credits  
Prerequisites: one introductory course in philosophy, 314 or permission of instructor. In-depth inquiry into methodology of Husserl and Heidegger and their influence upon Western European and American thought.
- 532 ARISTOTLE** 3 credits  
Prerequisite: 211 or permission of instructor. Detailed study of Aristotle's metaphysics, philosophy of nature, philosophy of mankind and ethics. Taught in alternate years.
- 534 KANT** 3 credits  
Prerequisite: 313 or permission of instructor. Study of Kantian system of thought and its relation to history of philosophy. Includes thorough investigation of one or more of Kant's philosophical works.
- 544 PROBLEMS IN PHILOSOPHY** 3 credits  
Prerequisites: two courses in philosophy or permission of instructor. Thorough, critical examination of one major philosophical problem.
- 562 THEORY OF KNOWLEDGE** 3 credits  
Prerequisites: three courses in philosophy. Examination of nature of knowledge, theories of perception, conception and truth, problem of induction and relation of language to knowledge.
- 564 PHILOSOPHY OF SCIENCE** 3 credits  
Prerequisites: 101, 170 or permission of instructor. Nature of scientific inquiry, types of explanations, laws and causality, theoretical concepts and reality. Also considers critics of hypothetical-deductive view of science, e.g., Hanson and Kuhn.
- 571 METAPHYSICS** 3 credits  
Prerequisites: 211, 312 and 313 or permission of instructor. Theories about ultimate nature and ultimate explanation of reality. Uses readings from classical and contemporary sources.
- 580 SEMINAR** 3 credits  
(May be repeated) Prerequisite: permission of instructor.
- 581 PHILOSOPHY OF LANGUAGE** 3 credits  
Prerequisites: 101 and 170 or permission of instructor. Contemporary philosophies about nature of language and its relation to reality and human thinking. Includes discussion of views of linguists such as Chomsky.
- 597 INDIVIDUAL STUDY** 1-3 credits  
(May be repeated for a total of six credits) Prerequisites: completion of required course of philosophy major or permission of instructor and department head. Directed independent study of philosopher, philosophy or philosophical problem under guidance of selected faculty member. Subject matter determined by selected faculty member in consultation with student. Graduate credit requires significant additional work which may include additional research paper.
- 615 SEMINAR: HISTORY OF PHILOSOPHY** 3 credits  
(May be repeated for a total of 12 credits) Prerequisite: permission of instructor. Study in philosophical works of one major philosopher.
- 626 ETHICAL THEORY** 3 credits  
Examination of problems related to conduct and decision making in light of the Western tradition as well as contemporary insights of positivism, phenomenology, existentialism, logical analysis, naturalism and pragmatism.
- 676 LOGICAL THEORY** 3 credits  
Advanced topics in logic such as modal logics and axiomatics. Recommended for law student, as logic of normative systems is treated. It is suggested that a graduate student be familiar with material covered in a course like 374 before taking this course.
- 680 SEMINAR** 3 credits  
(May be repeated for a total of nine credits)
- 699 MASTER'S THESIS** 2 credits  
(May be repeated)

## PHYSICS

### 3650:

- 500 HISTORY OF PHYSICS** 3 credits  
Prerequisite: 262 or 292. Study of origin and evolution of major principles and concepts characterizing contemporary physics.
- 506 PHYSICAL OPTICS** 3 credits  
Prerequisite: 320 and 3450/235. Propagation, reflection, and refraction of electromagnetic waves, superposition, polarization, interference and interferometry, Fresnel and Fraunhofer diffraction, Fourier optics, coherence theory, and quantum optics.
- 531 MECHANICS I** 3 credits  
Prerequisites: 292 and 3450/235. Mechanics at intermediate level. Newtonian mechanics, motion of a particle in one dimension, central field problem, system of particles, conservation laws, rigid bodies, gravitation.
- 532 MECHANICS II** 3 credits  
Prerequisite: 431/531. Advanced mechanics at the senior or beginning graduate level, moving coordinate systems, mechanics of continuous media. Lagrange's equations, tensor algebra and stress analysis, rotation or rigid bodies, vibration theory.
- 536 ELECTROMAGNETISM I** 3 credits  
Prerequisites: 292, 3450/235 or permission of instructor. Electricity and magnetism at intermediate level. Electrostatics and magnetostatics, electric field, scalar potential, dielectrics, Laplace's and Poisson's equations, current, magnetic field, vector potential, magnetic materials, inductance.
- 537 ELECTROMAGNETISM II** 3 credits  
Prerequisite: 436/536. Special relativity, four vectors, Maxwell's equations in covariant form; propagation, reflection and refraction of electromagnetic waves; multipole radiation.
- 541 QUANTUM PHYSICS I** 3 credits  
Prerequisites: 301 and 3450/235. Laboratory course stressing measurement techniques with contemporary laboratory apparatus. Experiment design, instrument calibration and reporting emphasized. Modern physics experiments and measurements of fundamental natural constants.
- 542 QUANTUM PHYSICS II** 3 credits  
Prerequisite: 441/541. Applications of quantum mechanics to atomic, nuclear and solid state physics. Tunneling and alpha decay, periodic potential, Hydrogen and Helium atoms, interatomic forces, quantum statistics.
- 551.2 ADVANCED LABORATORY I AND II** 2 credits each  
Prerequisite: 323 or permission of instructor. Applications of electronic, solid-state devices, techniques to research-type projects in contemporary physics. Introduction to resonance techniques, nuclear magnetic resonance, electron spin resonance, nuclear quadrupole resonance, Scintillation spectroscopy, Alpha- and beta-ray spectroscopy.
- 556 TECHNIQUES OF PHYSICS INSTRUCTION** 1 credit  
Teaching assistants are introduced to current research in learning physics, shown applications for their labroom, and trained in skills needed as a laboratory teaching assistant.
- 568 DIGITAL DATA ACQUISITION** 3 credits  
Prerequisite: 262 or 292. Designed to introduce science and mathematics students to use of digital techniques of interfacing instruments to microcomputers. Physical measurements and device control are emphasized.
- 570 INTRODUCTION TO SOLID-STATE PHYSICS** 3 credits  
Prerequisite: 441 or permission of instructor. Account of basic physical processes occurring in solids, with emphasis on fundamental relation between these processes and periodicity of crystalline lattice.
- 571.2 NMR SPECTROSCOPY I AND II** 2 credits each  
Prerequisite: 292 or permission of instructor. Theoretical basis and experimental techniques of NMR spectroscopy. Classical concepts and quantum mechanical treatments of NMR. Bloch equations; spin-spin and spin-lattice relaxation times. Steady state and transient phenomena. General features of broadline and high-resolution NMR spectra. NMR instrumentation and operating principles. Theory and analysis of high-resolution NMR spectra. Quantitative applications of broadline and high-resolution NMR spectra and determination of physical and chemical structures.
- 581.2 METHODS OF MATHEMATICAL PHYSICS I AND II** 3 credits each  
Prerequisites: 292, 3450/235 and senior or graduate standing in a physical science or engineering. Vectors, generalized coordinates, tensors, calculus of variations, vector spaces, linear transformations, matrices, eigenvalues, Hilbert space, boundary value problems, transcendental functions, complex variables, analytic functions, Green's functions, integral equations.
- 588 SELECTED TOPICS: PHYSICS** 1-4 credits  
(May be repeated) Prerequisite: permission. Consideration of selected topics, procedures, techniques, materials or apparatus of current interest in physics.
- 590 WORKSHOP** 1-4 credits  
(May be repeated) Prerequisite: permission. Further investigations of various selected topics in physics, under guidance of faculty member.
- 597 INDEPENDENT STUDY** 1-4 credits  
(May be repeated) Prerequisite: permission. Further investigations of various selected topics in physics, under guidance of faculty member.
- 598 PHYSICS COLLOQUIUM** 1 credit  
Lectures on current research topics in physics by invited speakers. May be repeated, but only one credit counts toward M.S. degree. Credit/Noncredit.
- 605 COMPUTER PHYSICS: NUMERICAL SOLUTIONS TO PHYSICS PROBLEMS I** 3 credits  
Prerequisite: permission. Review of FORTRAN and basic topics in computer science. Numerical solutions to physics problems, including Newton's and Schrodinger's equations. Treatment and reduction of experimental data, plotting, simulation.
- 606 COMPUTER PHYSICS: NUMERICAL SOLUTIONS TO PHYSICS PROBLEMS II** 3 credits  
Prerequisite: 605 or permission. Data reduction, Calcomp plotting, comparison of theoretical models with data, linear and non-linear least squares curve-fitting. May accommodate scientific problems of individual interest.

- 615 ELECTROMAGNETIC THEORY I** *3 credits*  
Prerequisite: 437/537 or permission of instructor. Electrostatics and magnetostatics at advanced level for graduate students, boundary value problems, dielectrics, multipole expansions, time-varying fields, Maxwell's equations and electromagnetic waves, reflection, refraction, wave guides and cavities.
- 616 ELECTROMAGNETIC THEORY II** *3 credits*  
Prerequisite: 615. Scattering and diffraction, plasma physics, special theory of relativity, dynamics of relativistic particles in fields, collisions of charged particles, radiation from moving charges, bremsstrahlung, multipole fields.
- 625 QUANTUM MECHANICS I** *3 credits*  
Prerequisites: 441/541, 481/581 or permission of instructor. Basic concepts of quantum mechanics, representation theory, particle in a central field, addition of angular momenta and spins, Clebsch-Gordan coefficients, perturbation theory, scattering, transition probabilities.
- 626 QUANTUM MECHANICS II** *3 credits*  
Prerequisite: 625. Foundations of relativistic quantum mechanics. Klein-Gordon and Dirac equations, spin-zero particle and spin-1/2 particles in electromagnetic field, second quantization of bosons and fermions, superfluidity and super conductivity.
- 641 LAGRANGIAN MECHANICS** *3 credits*  
Prerequisite: 432/532 or permission of instructor. Principle of least action and Lagrangian equation of motion, conservation laws, integration or equation of motion, collisions, small oscillations, Hamilton's equations, canonical transformations.
- 661 STATISTICAL MECHANICS** *3 credits*  
Prerequisite: 442/542 or permission of instructor. Fundamental principles of statistical mechanics, Gibbs, Fermi and Bose Statistics, solids, liquids, gases, phase equilibrium, chemical reactions.
- 684 ADVANCED NUCLEAR PHYSICS** *3 credits*  
Prerequisite: 626. Quantum mechanics applied to nucleus. Interaction of radiation with nucleus, nuclear scattering, nuclear reactions; energy levels of nuclei.
- 685 SOLID-STATE PHYSICS I** *3 credits*  
Prerequisites: 470, 625 or permission of instructor. Theory of physics of crystalline solids. Properties of reciprocal lattice and Bloch's theorem. Lattice dynamics and specific heat. Electron states; cellular method, tight-binding method, Green's function method.
- 686 SOLID-STATE PHYSICS II** *3 credits*  
Prerequisite: 685. Orthogonalized plane and pseudo potentials. Electron-electron interaction; screening by impurities, Friedel sum rule and plasma oscillations. Dynamics of electrons, transport properties and Fermi surface.
- 689 SPECIAL PROBLEMS IN THEORETICAL PHYSICS** *1-3 credits*  
(May be repeated) Prerequisite: permission. Intended to facilitate expansion of particular areas of interest in theoretical physics, by consultation with faculty member and independent study beyond available course work.
- 691 SEMINAR IN THEORETICAL PHYSICS** *1-3 credits*  
(May be repeated) Prerequisite: permission.
- 697 GRADUATE RESEARCH** *1-5 credits*  
Prerequisite: permission. Candidates for M.S. degree may obtain up to five credits for faculty supervised research projects. Grades and credit received at completion of such projects.
- 698 SPECIAL TOPICS: PHYSICS** *1-4 credits*  
Prerequisite: permission. Enables student who needs information in special areas, in which no formal course is offered, to acquire knowledge in these areas.
- 699 MASTER'S THESIS** *1 credit*  
Prerequisite: permission. With approval of department, one credit may be earned by candidate for M.S. degree upon satisfactory completion of a master's thesis.
- 542 METHODS OF POLICY ANALYSIS** *3 credits*  
Prerequisite: 201. Examines variety of methods available for analyzing public policies. Techniques of cost benefit analysis, evaluation research quasi-experimentation are covered as well as consideration of ethical questions in policy analysis, the practical problems facing policy analysts.
- 561 THE SUPREME COURT AND CONSTITUTIONAL LAW** *3 credits*  
Prerequisite: 100 or permission. Interpretation of the Constitution by the Supreme Court with emphasis on federal judicial, legislative and executive power, separation of powers; and federalism.
- 562 THE SUPREME COURT AND CIVIL LIBERTIES** *3 credits*  
Prerequisite: 100 or permission. Interpretation of the Constitution by the Supreme Court with emphasis on freedom of speech and press, freedom of religion, criminal rights and right to privacy.
- 570 CAMPAIGN MANAGEMENT I** *3 credits*  
Prerequisite: six credits of political science or permission. Reading, research and practice in campaign management.
- 571 CAMPAIGN MANAGEMENT II** *3 credits*  
Prerequisite: 470/570. The second course in campaign management. Focus is on timing, coalition building, candidate positioning, event planning, internal organization, and other elements of campaign strategy.
- 572 CAMPAIGN FINANCE** *3 credits*  
Prerequisite: six credits of political science or permission. Reading and research in financial decision making in political campaigns.
- 573 VOTER CONTACT AND ELECTIONS** *3 credits*  
Prerequisite: six credits of political science or permission. Theoretical and practical approaches to gaining votes in all types of political campaigns.
- 574 POLITICAL OPINION, BEHAVIOR AND ELECTORAL POLITICS** *3 credits*  
Prerequisite: 100 or 201 or permission. Advanced analysis of psychological, cultural and group processes of opinion formation and change. Attention given to the effect of opinion change on electoral outcomes.
- 575 AMERICAN INTEREST GROUPS** *3 credits*  
Prerequisite: six credits of political science or permission. Reading and research on the development, structure and function of interest groups in the United States.
- 576 AMERICAN POLITICAL PARTIES** *3 credits*  
Prerequisite: six credits of political science or permission. Reading and research on the development, structure and function of parties in the United States.
- 580 POLICY PROBLEMS** *3 credits*  
(May be repeated for a total of six credits) Prerequisite: 380 or permission. Intensive study of selected problems in public policy.
- 590 WORKSHOP** *1-3 credits*  
(May be repeated) Group studies of special topics in political science. May not be used to meet undergraduate or graduate requirements in political science. Elective credit only.
- 600 SCOPE AND THEORIES OF POLITICAL SCIENCE** *3 credits*  
Prerequisite: six credits of political science or permission of instructor. Emphasis on the nature, scope and content of political theory; theory construction and validation in political science.
- 601 RESEARCH METHODS IN POLITICAL SCIENCE** *3 credits*  
Prerequisites: six credits of political science, including 440 (or a satisfactory equivalent) or permission of instructor. Techniques of quantitative research methodology in political science; utility and limitations of quantitative analysis.
- 610 SEMINAR IN INTERNATIONAL POLITICS** *3 credits*  
Prerequisite: six credits of political science or permission. Analysis of current problems in theory and practice of politics and organization.
- 620 SEMINAR IN COMPARATIVE POLITICS** *3 credits*  
Prerequisites: six credits of political science or permission. Research selected topics in comparative politics. Comparative method.
- 626 SEMINAR IN POLITICS OF DEVELOPING NATIONS** *3 credits*  
Prerequisites: six credits of political science or permission. Selected topics investigated. Emphasis on theories of political development.
- 630 SEMINAR IN NATIONAL POLITICS** *3 credits*  
Prerequisites: six credits of political science or permission. Reading and research on formulation, development and implementation of national policy in one or more areas of contemporary significance.
- 641 SEMINAR IN INTERGOVERNMENTAL RELATIONS** *3 credits*  
Prerequisites: six credits of political science or permission. Graduate-level examination of problems resulting from changing relations between levels of government in the United States; comparisons with other federal systems.
- 660 SEMINAR ON CIVIL LIBERTIES AND THE JUDICIAL PROCESS** *3 credits*  
Prerequisites: six credits of political science or permission. Civil liberties and judicial process viewed in political context. Readings and research on selected topics.
- 668 SEMINAR IN PUBLIC POLICY AGENDAS AND DECISIONS** *3 credits*  
Prerequisites: six credits of political science or permission. Reading and research on the development of public policy issues and modes of decision making used by policy makers.
- 670 SEMINAR IN THE ADMINISTRATIVE PROCESS** *3 credits*  
Prerequisites: six credits of political science or permission. Intensive examination of administrative implementation of public policies. Readings and research on selected topics.
- 672 SEMINAR: POLITICAL INFLUENCE AND ORGANIZATIONS** *3 credits*  
Prerequisites: permission. Examination of how public concerns and demands are resolved or diffused. A theoretical and applied look at parties, interest groups, public opinion, media, and protest.
- 680 SEMINAR IN URBAN AND REGIONAL POLITICS** *3 credits*  
Prerequisites: six credits of political science or permission. Focus on processes of policy formulation and execution in modern metropolitan community, with emphasis on structural functional context.
- 690 SPECIAL TOPICS IN POLITICAL SCIENCE** *1-3 credits*  
Prerequisites: six credits of political science or permission. Graduate-level examination of selected topics in American politics, comparative politics, international politics, international politics or political theory.
- 695 INTERNSHIP IN GOVERNMENT AND POLITICS** *3-6 credits*  
(May be repeated for a total of six credits.) Prerequisite: Permission of graduate adviser. Supervised individual placement with political office holders, party groups, governmental agencies, law firms and other organizations providing professional-level work.

## POLITICAL SCIENCE

### 3700:

- 502 POLITICS AND THE MEDIA** *3 credits*  
Examination of relationships between the press, the news media and political decision makers.
- 506 POLITICS IN THE MIDDLE EAST** *3 credits*  
The rise of the state system in the Middle East after World War I; an analysis of the sociocultural, ideological forces influencing the political behavior of the people of the Middle East. In-depth study of selected political systems.
- 510 INTERNATIONAL DEFENSE POLICY** *3 credits*  
Prerequisite: At least one of the following: 220, 310, 3400, 340, 360, 407, 408, or permission. Introduction to political uses of military forces. Major focus on methodological, conceptual, and ethical dilemmas confronted in developing and implementing defense policy.
- 511 THEORIES OF INTERNATIONAL POLITICAL ECONOMY** *3 credits*  
Prerequisite: 310 or permission of instructor. This course examines the predominant and competing theories of international political economy, including imperialism, world systems analysis, long-wave theory, neo-mercantilism, and neo-realism.
- 512 GLOBAL ENVIRONMENT POLITICS** *3 credits*  
Prerequisites: 300, 310 or permission of instructor. Examines the general dimensions of the global environmental challenge, including the roles played by technology and the structure of the world system.
- 515 COMPARATIVE FOREIGN POLICY** *3 credits*  
Prerequisite: 310 or 220 or permission. Study of foreign policies of selected nations, with special attention to processes and instruments of decision making of the major powers.
- 520 ISSUES AND APPROACHES IN COMPARATIVE POLITICS** *3 credits*  
Prerequisite: 300 or permission of instructor. Detailed examination of approaches to the study of comparative politics, political parties, elites and various theories of revolution.
- 525 LATIN AMERICAN POLITICS** *3 credits*  
Prerequisite: 300 or permission of instructor. Examination of patterns of government and politics in Latin American area.
- 540 SURVEY RESEARCH METHODS** *3 credits*  
Prerequisite: 100 or 201 or permission. Study of the survey research methods as applied to the analysis of public opinion, political behavior and public policy formation.
- 541 THE POLICY PROCESS** *3 credits*  
Prerequisites: eight credits in political science. Intensive study of policy-making process, emphasizing roles of various participants in executive and legislative branches as well as private individuals and groups.

- 696 TOPICS IN MASTER'S RESEARCH** 1-3 credits  
Prerequisite: permission of advisor. (May be repeated for a total of 10 credits. No more than two credits apply to degree requirements.) Research in suitable topics in political science or applied political science culminating in a research paper. Graded credit/non-credit.
- 697 INDEPENDENT RESEARCH AND READINGS** 1-4 credits  
(May be repeated, but no more than six credits toward the master's degree in political science) Prerequisite: permission.
- 698 POLITICAL SCIENCE PRACTICUM** 3 credits  
Prerequisite: permission of instructor. Professional seminar required of new graduate students. May not be applied toward degree requirements. Covers disciplinary subfields, teaching, research practices, career tracks and program selections. Graded credit/non-credit.
- 699 MASTER'S THESIS** 2-6 credits

## PSYCHOLOGY

### 3750:

- 500 PERSONALITY** 4 credits  
Prerequisite: Admission to the Graduate School. Consideration of current conceptualizations of the normal personality with emphasis on methods of measurement, experimental findings and research techniques.
- 510 PSYCHOLOGICAL TESTS AND MEASUREMENTS** 4 credits  
Prerequisite: Admission to the Graduate School. Consideration of the nature, construction and use of tests and measurements in industry, government and education. Includes aptitude and achievement tests, rating scales, attitude and opinion analysis.
- 520 ABNORMAL PSYCHOLOGY** 4 credits  
Prerequisite: Admission to the Graduate School. Survey of syndromes, etiology, diagnoses and treatments of major psychological conditions ranging from transient maladjustments to psychoses.
- 530 PSYCHOLOGICAL DISORDERS OF CHILDREN** 4 credits  
Prerequisite: Admission to the Graduate School. Survey of syndromes, etiologies and treatments of behavioral disorders in children from the standpoint of developmental psychology. Behavioral data and treatment approaches emphasized.
- 543 HUMAN RESOURCE MANAGEMENT** 4 credits  
Prerequisite: Admission to the Graduate School. The application of psychological theory to the effective management of human resources in an organization, including recruitment, selection, training and retention of personnel.
- 544 ORGANIZATIONAL THEORY** 4 credits  
Prerequisite: Admission to the Graduate School. The application of psychological theory to macro-level processes in organizations including leadership, motivation, task performance, organizational theories and development.
- 545 PSYCHOLOGY OF SMALL GROUP BEHAVIOR** 4 credits  
Prerequisite: Admission to the Graduate School. Intensive investigation of factors affecting behavior and performance in small groups including effects of personality, social structures, task, situation and social-cognitive variables.
- 550 COGNITIVE DEVELOPMENT** 4 credits  
Prerequisite: Admission to the Graduate School. Theory and research on life-span changes in cognitive processes including concept formation/categorization, information processing and Piagetian assessment tasks.
- 560 HISTORY OF PSYCHOLOGY** 3 credits  
Prerequisite: Admission to the Graduate School. Psychology in pre-scientific period and details of developmental or systematic viewpoints in 19th and 20th Centuries.
- 590 WORKSHOP IN PSYCHOLOGY** 1-5 credits  
Prerequisite: Admission to the Graduate School. (May be repeated. May not be used to meet undergraduate or graduate major requirements in psychology.) Group studies of special topics in psychology.
- 601.2 PSYCHOLOGICAL RESEARCH USING QUANTITATIVE AND COMPUTER METHODS I AND II** 4 credits each  
Sequential prerequisite: Graduate standing in psychology or the joint doctoral program in counseling psychology or special nondegree students with permission. Psychological research problems applying quantitative and computer methods. Topics include research design, sampling, controls, threats to validity, hypotheses testing, psychological measurement, error, robustness and power.
- 810 CORE I: SOCIAL PSYCHOLOGY** 2 credits  
Prerequisite: graduate standing in psychology or the collaborative doctoral program in counseling psychology or permission of instructor. Introduction to empirical research and theories on the psychological processes related to interpersonal behavior, focusing on topics like attitude change, social influence, and prosocial behavior.
- 620 CORE II: COGNITIVE PSYCHOLOGY** 2 credits  
Prerequisite: graduate standing in psychology or the collaborative doctoral program in counseling psychology or permission of instructor. Survey of theories, concepts, empirical phenomena, and methodologies in human cognitive psychology. Topics include attention, cognitive capacity, learning, memory, categorization, skill acquisition/expertise, and training effectiveness.
- 630 CORE III: INDIVIDUAL DIFFERENCES** 2 credits  
Prerequisite: graduate standing in psychology or the collaborative doctoral program in counseling psychology or permission of instructor. Survey of theoretical perspectives on individual differences in personality and behavior and of literature on between- and within-group cultural variables influencing personality development and assessment.
- 640 CORE IV: BIOPSYCHOLOGY** 2 credits  
Prerequisite: graduate standing in psychology or the collaborative doctoral program in counseling psychology or permission of instructor. Survey of nervous system structure/function including neuroanatomy, neuron physiology, and synaptic transmission. Also overviews biological bases of learning, memory, consciousness, intelligence, psychopharmacology, behavior genetics.
- 650 CORE V: SOCIAL-COGNITIVE PSYCHOLOGY** 2 credits  
Prerequisite: graduate standing in psychology or the collaborative doctoral program in counseling psychology or permission of instructor. Social and cognitive theory/research applied to the issue of how people understand their social experiences. Topics include: person perception, attribution, social categorization, social inference.
- 653 GROUP COUNSELING** 4 credits  
Prerequisites: 671, 710; or 5600:643, 645; or permission of instructor. Emphasis is placed on providing the student with the knowledge and understanding of theory, research and techniques necessary for conducting group counseling sessions.
- 660 ADVANCED INDUSTRIAL AND ORGANIZATIONAL PSYCHOLOGY** 4 credits  
Prerequisite: graduate standing in psychology or permission of instructor. An advanced survey of industrial and organizational psychology which involves the application of psychological principles to the work place.
- 671 PREPRACTICUM IN COUNSELING PSYCHOLOGY** 2 credits  
Prerequisites: 630, graduate standing in psychology and permission of instructor. Introduction to and training in skills used in process of counseling and psychotherapy. This course is a preparation for actual client contact in subsequent practica. Credit/Noncredit.
- 672 COUNSELING PRACTICUM** 4 credits  
Prerequisites: 630, 671, graduate standing in psychology and permission of instructor. Extension and development of therapeutic skills and intervention techniques, with supervised training in counseling clients in the psychology department Counseling Clinic. Credit/Noncredit.
- 673 COUNSELING PRACTICUM II** 4 credits  
Prerequisites: 630, 671, 672, graduate standing in psychology and instructor's permission. Supervised experience with clients in the psychology department Counseling Clinic. Training covers counseling, assessment and case management skills. Credit/Noncredit.
- 674 PERSONNEL PRACTICUM** 1-4 credits  
(May be repeated) Prerequisites: 610, graduate standing in psychology, 14 credits of graduate psychology and departmental permission. Supervised field experience in industrial/organizational psychology in settings including business, government or social organizations. The field experience requires the application of industrial/organizational psychological theories and techniques. Credit/Noncredit.
- 675 APPLIED COGNITIVE AGING PRACTICUM** 1-4 credits  
(May be repeated) Prerequisites: 610, graduate standing in psychology, 14 credits of graduate psychology and departmental permission. Supervised field experience in applied cognitive aging psychology to provide the student with the opportunity to apply skills and knowledge acquired in the academic setting and to obtain knowledge about community programs and agencies which focus on developmental processes. Credit/Noncredit.
- 699 MASTER'S THESIS** 1-4 credits  
(May be repeated) Prerequisite: departmental permission. Research analysis of data and preparation of thesis for master's degree.
- 700 SURVEY OF PROJECTIVE TECHNIQUES** 4 credits  
Prerequisite: 630 or instructor's permission. Introduction to rationale, assumptions and ethics, and research of projective testing. Elementary administration, scoring and interpretation of Rorschach; and survey of other important contemporary projective instruments.
- 701 PSYCHODIAGNOSTICS** 4 credits  
Prerequisite: 700. Application of psychological testing to problems of diagnosis and evaluation. Practical experience in administration, scoring and interpretation. Integration of projective data with other assessment techniques in variety of settings.
- 706 CURRENT ISSUES IN COUNSELING** 4 credits  
Prerequisite: 630. Advanced study of the background, theoretical foundations, techniques, research and applications of counseling psychology as a science and profession.
- 707 SUPERVISION IN COUNSELING PSYCHOLOGY I** 3 credits  
Prerequisite: doctoral standing or permission of instructor. Instruction and experience in supervising a graduate student in counseling.
- 710 THEORIES OF COUNSELING AND PSYCHOTHERAPY** 4 credits  
Prerequisite: 630 or departmental permission. Major systems of individual psychotherapy explored within a philosophy of science framework: Freudian, behavioral, Rogerian, cognitive, and other. Includes research, contemporary problems and ethics.
- 711 VOCATIONAL BEHAVIOR** 4 credits  
Prerequisite: 630 or departmental permission. Theories and research on vocational behavior and vocational counseling. Topics include major theories of vocational behavior, empirical research on these theories, applied work in vocational counseling and applied research.
- 712 PRINCIPLES AND PRACTICE OF INDIVIDUAL INTELLIGENCE TESTING** 4 credits  
Prerequisites: 630 or graduate standing in school psychology, and instructor's permission. History, principles and methodology of intelligence testing, supervised practice in administration, scoring and interpretation of individual intelligence tests for children and adults.
- 713 PROFESSIONAL, ETHICAL AND LEGAL ISSUES IN COUNSELING PSYCHOLOGY** 4 credits  
Prerequisite: doctoral residency or permission. Examination of major issues in the field such as the counselor as a professional and as a person, and issues, problems and trends in counseling.
- 714 OBJECTIVE PERSONALITY EVALUATION** 4 credits  
Prerequisites: completion of 630 or 400/500, and 420/520, and 5600:645. Study of the development, administration, and interpretation of objective instruments for personality assessment (MMPI, CPI, MBTI, 16PF and selected additional inventories).
- 715 RESEARCH DESIGN IN COUNSELING I** 3 credits  
Prerequisite: doctoral standing or permission. Study of research designs, evaluation procedures, and review of current research.
- 717 ISSUES OF DIVERSITY IN COUNSELING PSYCHOLOGY** 4 credits  
Prerequisites: 630; one semester of practicum work. Critical examination and application of research and theory in counseling diverse populations, focusing on race/ethnicity, sex/gender, sexual orientation, age, disability, and spirituality.
- 718 HISTORY AND SYSTEMS IN PSYCHOLOGY** 2 credits  
Prerequisite: 630. Philosophical and scientific antecedents of psychology and details of the development of systematic viewpoints in the 19th and 20th centuries.
- 726 CHILD PSYCHOLOGY** 4 credits  
Prerequisite: 620 or permission. Current research in child psychology covered with some emphasis on cognitive development. Topics include language, memory, intelligence, hyperactivity, and selected aspects of social development.
- 727 PSYCHOLOGY OF ADULTHOOD AND AGING** 4 credits  
Prerequisite: 620 or permission. Aspects of development, aging with emphasis on life-span methodology and research design including age-related changes in intelligence, personality sensation, perception, learning, memory, and socialization and intervention approaches.
- 728 APPLIED COGNITIVE AGING PSYCHOLOGY: SOCIAL DEVELOPMENTAL** 4 credits  
Prerequisites: 610, 620, 727 and graduate standing in psychology or instructor permission. Study of factors influencing social development in the later years. Topics to be covered include: social support, life stress, well-being, health, caregiving, and other issues.
- 730 THEORIES OF LEARNING** 4 credits  
Prerequisite: 620 or departmental permission. Contemporary review of research and theory in language and memory. Process-oriented approach adopted with emphasis on developmental issues.
- 731 APPLIED COGNITIVE AGING PSYCHOLOGY: INFORMATION PROCESSING** 4 credits  
Prerequisite: 620, 727 and graduate standing in psychology; or instructor permission. Perception, learning, motivation, attention, and problem solving in adulthood and their effects on areas such as environmental design, mobility, independence, neuropsychological assessment, and skilled performance.

- 732 APPLIED COGNITIVE AGING PSYCHOLOGY: HIGHER PROCESSES** 4 credits  
Prerequisite: 620, 727 and graduate standing in psychology; or instructor permission. Memory, comprehension, decision processes, intelligence, and knowledge, and their relation to everyday functioning in areas such as dementia, communication, judgment, awareness, expertise, wisdom, and creativity.
- 733 APPLIED COGNITIVE AGING PSYCHOLOGY: RESEARCH** 4 credits  
Intensive reading in selected content area; design and conduct of a complete research study. May be repeated.
- 734 APPLIED COGNITIVE AGING PSYCHOLOGY: CURRENT ISSUES** 2 credits  
Prerequisite: 620 or permission. Examination of applied, theoretical, methodological, and analytic issues of current importance to the field of cognitive aging psychology. May be repeated for a total of 10 credits.
- 736 THE PSYCHOLOGY OF MENTAL RETARDATION** 4 credits  
Prerequisite: 620 or graduate standing in psychology or permission of instructor. Current knowledge about the cognitive and social development of retarded individuals is examined. The first half of the course is a broad survey emphasizing methodology and findings about the mentally retarded. The second half involves an in-depth exploration of selected applied and basic research topics such as reaction to failure, mainstreaming, sexuality, training, behavioral problems, knowledge, and thinking.
- 737 THE PSYCHOLOGY OF LEARNING DISABILITIES** 4 credits  
Prerequisite: 620 or graduate standing in psychology or permission of instructor. Examination of the theories and research regarding learning and reading disabilities. Emphasis is on a critical evaluation of the research which investigates hypothesized process differences between learning-disabled and normal-achieving children.
- 738 APPLIED DEVELOPMENTAL PSYCHOLOGY** 4 credits  
Prerequisites: 620 and graduate standing in psychology or permission of instructor. Examination of methodologies, evaluation, child abuse, early intervention, day care, kibbutzim, social networks, subcultural variations, and hospice/dying.
- 740 INDUSTRIAL GERONTOLOGY** 4 credits  
Prerequisites: 610 and 620, graduate standing in psychology or departmental permission for other students who have completed 610 and 620. Study of age-related issues in work involving adult and older adult workers. Topics include personnel selection, training, motivating and appraising older employees; health and safety; job design, vocational guidance; and retirement.
- 741 SURVEY OF COUNSELING METHODS** 4 credits  
Prerequisites: 620 and 630; graduate standing in psychology or permission of instructor. An experiential survey of treatment methods from a variety of theoretical approaches. Approaches include, but are not limited to, behavioral, gestalt, cognitive and psychodynamic methods.
- 750 ADVANCED PSYCHOLOGICAL TESTS AND MEASUREMENTS** 4 credits  
Prerequisites: 610 and graduate standing in psychology or departmental permission for other students who have completed 610. Analysis of test construction techniques and statistical analyses of tests with a review of published tests and measurements used in psychology. Study of psychometric theory and principles.
- 751 ORGANIZATIONAL PSYCHOLOGY** 4 credits  
Prerequisites: 610 and graduate standing in psychology or departmental permission for other students who have completed 610. Applies the general systems theory framework to the study of the relationships between organizational characteristics and human behavior, the internal processes of organizations, and the relationships between organizations and their environment.
- 752 PERSONNEL SELECTION AND PERFORMANCE EVALUATION** 4 credits  
Prerequisites: 610 and graduate standing in psychology or permission for other students who have completed 610. Review of strategies employed by industrial/organizational psychologists for personnel selection, placement and promotion. Survey of objective and subjective criteria used in performance appraisal including test validation and training effectiveness.
- 753 TRAINING** 2 credits  
Prerequisites: graduate standing in psychology and 650 or permission to students who have completed 650. Review of industrial training methods and programs in terms of various theoretical orientations, as well as consideration of techniques to evaluate these programs.
- 754 RESEARCH METHODS IN PSYCHOLOGY** 2-4 credits  
Prerequisites: 610, 620 and graduate standing in psychology or permission. Scientific method and its specific application to psychology. Topics include data collection, validity, reliability, use of general linear model and its alternatives and power analysis.
- 755 COMPUTER APPLICATIONS IN PSYCHOLOGICAL RESEARCH** 4 credits  
Prerequisites: 610 and graduate standing in psychology or permission for other students who have completed 610. Practicum in application of computers to psychological research including data collection, analysis and interpretation. Also covers computer simulation of decision making including use of different models.
- 756 ROLE OF ATTITUDES AND VALUES IN INDUSTRIAL/ ORGANIZATIONAL PSYCHOLOGY** 4 credits  
Prerequisites: 610 and graduate standing in psychology or departmental permission for other students who have completed 610. Consideration of the role of attitudes and values in the prediction of behavior including consumer psychology, explaining attitude changes, measurement of attitudes and the use of survey methodology.
- 757 ORGANIZATIONAL MOTIVATION AND LEADERSHIP** 4 credits  
Prerequisites: 610 and graduate standing in psychology or departmental permission for other students who have completed 610. Survey of theories of motivation specifying both the intrinsic and extrinsic determinants of worker motivation. The leadership process and its relation to motivation, group performance and attributions is also analyzed.
- 758 ENGINEERING PSYCHOLOGY AND JOB DESIGN** 4 credits  
Prerequisites: 610 and graduate standing in psychology or permission for other students who have completed 610. Survey of field of engineering psychology. Covers such topics as job design, task analysis, man-machine systems analysis, working conditions and accidents.
- 759 JOB EVALUATION AND EQUAL PAY** 4 credits  
Prerequisite: 610. Major job evaluation systems will be reviewed and critiqued. Issues such as minimum qualifications for a job will be reviewed. Advantages and disadvantages of various job evaluation systems will be compared. Issues concerning federal regulation including the Equal Pay Act, comparable worth and other issues will be discussed. Regression approaches to job evaluation and applicable court cases will be reviewed.
- 760 ORGANIZATIONAL CHANGE AND TRANSFORMATION** 4 credits  
Prerequisites: 610 or permission. Survey of theories and introduction to practical methods of organizational change and transformation used to increase organizational effectiveness and improve employee quality of work life.
- 761 INFORMATION PROCESSING AND INDUSTRIAL/ ORGANIZATIONAL PSYCHOLOGY** 4 credits  
Prerequisites: 610, 620, 630, and 640. Coverage of current theories in cognitive psychology is applied to traditional concerns of industrial/organizational psychology such as performance appraisal or motivation.

- 762 PERSONNEL PSYCHOLOGY AND THE LAW** 4 credits  
Prerequisite: 610. Issues in personnel psychology which have legal implications are reviewed. The impact of recent court decisions are evaluated in staffing and compensation.
- 780 GRADUATE SEMINAR IN PSYCHOLOGY** 1-4 credits  
(May be repeated) Prerequisites: graduate standing in psychology and permission. Special topics in psychology.
- 795 ADVANCED COUNSELING PRACTICUM** 4 credits  
(May be repeated) Prerequisites: 671, 672, 673 and permission of instructor. This course provides graduate students in counseling with actual client contacts and supervisory experiences under faculty supervision. Credit/Noncredit.
- 796 COUNSELING PSYCHOLOGY PRACTICUM** 4 credits  
(May be repeated) Prerequisite: 795 (eight hours) or 5600/675 (five hours). Advanced counseling psychology students will have supervised training with clients in a variety of settings and will focus on supervised development of specialized theoretical applications. Credit/Noncredit.
- 797 INDEPENDENT READING AND/OR RESEARCH** 1-3 credits  
(May be repeated) Prerequisite: permission. Individual readings and/or research on a topic under supervision of faculty member with whom specific arrangements have been made.
- 899 DOCTORAL DISSERTATION** 1-12 credits  
Prerequisite: open to a properly qualified student. Required minimum 12 credits; maximum subject to departmental approval. Supervised research on topic deemed suitable by the dissertation committee.

## SOCIOLOGY

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### 3850:

- 503 HISTORY OF SOCIOLOGICAL THOUGHT** 3 credits  
Prerequisite: 100 or permission. Examination of major scholars in the classical sociological tradition. Lecture.
- 504 CONTEMPORARY SOCIOLOGICAL THEORIES** 3 credits  
Prerequisite: 403 or permission. Examination and critical evaluation of works of modern sociological theorists, emphasizing current theoretical approaches to issues of social order and social change. Lecture.
- 510 SOCIAL STRUCTURES AND PERSONALITY** 3 credits  
Prerequisite: 100 or permission. Interrelationships between position in society, personality characteristics. Personality treated as both result and determinant of social structure and process. Lecture.
- 511 SOCIAL INTERACTION** 3 credits  
Prerequisite: 100 or permission. Intensive study of advanced theory and research in social psychology, particularly how social interaction and self-conception affect one another. Lecture.
- 512 SOCIALIZATION: CHILD TO ADULT** 3 credits  
Prerequisite: 100 or permission. Theoretical and empirical analyses of process by which infant, child, adolescent and adult learn social and cultural requirements necessary to function in new roles, changing roles and society in general.
- 521 RACIAL AND ETHNIC RELATIONS** 3 credits  
Prerequisite: 100 or permission. Analysis of structure and dynamics of race and ethnic relations from a variety of perspectives emphasizing both historical and contemporary issues. Lecture.
- 523 SOCIOLOGY OF WOMEN** 3 credits  
Prerequisites: 100 or permission of instructor. Examination of research and theories pertaining to women's status in society, including economic conditions, the relationship between structure and experience, and other gender-related issues.
- 525 SOCIOLOGY OF URBAN LIFE** 3 credits  
Prerequisite: 100 or permission. Emergence and development of urban society. Examination of urban social structure from neighborhood metropolises, the problems and prospects. Emphasis on various life styles of urban subcultures. Lecture/discussion.
- 528 THE VICTIM IN SOCIETY** 3 credits  
Prerequisites: 100 or permission of instructor. Study of the nature, causes, and consequences of victimization with special focus on crime victimization.
- 529 PROBATION AND PAROLE** 3 credits  
Prerequisite: 330 or 430 or permission. Analysis of how probationers and parolees are selected, supervised and then released into private life. Emphasis on current and past social research. Lecture/discussion.
- 530 JUVENILE DELINQUENCY** 3 credits  
Prerequisite: 100 or permission. Analysis of social structure and process from which delinquency develops. Emphasis on current and past research. Lecture/discussion.
- 531 CORRECTIONS** 3 credits  
Prerequisite: 330 or 430. Theories, belief systems, correctional practices and effectiveness as related to offender groups. Lecture/discussion/field experience.
- 533 SOCIOLOGY OF DEVIANT BEHAVIOR** 3 credits  
Prerequisites: 100 and at least six additional credits of sociology courses or permission. Survey of theories of deviant behavior and relevant empirical research. Special emphasis given to interaction processes and social control. Lecture.
- 540 SOCIOLOGY OF RELIGION** 3 credits  
Prerequisite: 100 or permission. Study of forms of religion and their social functions with emphasis on religion in American society. Lecture.
- 541 SOCIOLOGY OF LAW** 3 credits  
Prerequisites: 100 and at least six additional credits of sociology courses or permission. Social origins and consequences of law and legal processes. Emphasis on uses of law, social change and aspects of legal professions. Lecture.
- 542 SOCIOLOGY OF EDUCATION** 3 credits  
Prerequisite: 100 or permission. Analysis of education from an organizational and social psychological perspective. Topics include: desegregation; busing; neighborhood schools; impact of family, peers and teachers on learning; school organization. Lecture.
- 543 INDUSTRIAL SOCIOLOGY** 3 credits  
Prerequisite: six credits of sociology or industrial management. Comparison of formal and informal structures in industrial organizations; analysis of work roles and status systems; communication processes; relation of work plant to community and society. Lecture.
- 544 SOCIAL ISSUES IN AGING** 3 credits  
Prerequisite: 100 or permission. A look into the major issues and problems facing older persons. Special attention is given to the unmet needs of the elderly as well as an examination of current societal policy and programs to meet these needs.

- 550 SOCIOLOGY OF MENTAL ILLNESS** 3 credits  
Prerequisite: 100 or permission. The social history of the mental hospital, theories and epidemiology of mental illness, community-based treatment models, the organization of mental health services, the role of personal social networks and mutual support groups.
- 594 WORKSHOP IN SOCIOLOGY** 1-3 credits  
(May be repeated) Group studies of special topics in sociology. May not be used to meet departmental undergraduate or graduate major requirements. May be used for elective credit only.
- 600 FUNDAMENTALS OF SOCIOLOGY** 3 credits  
Accelerated introduction to sociology for the graduate student deficient in sociological background or from other disciplines who intend to take further graduate courses in sociology. Lecture.
- 601 PRO-SEMINAR IN SOCIOLOGY** 2 credits  
Prerequisite: teaching/research assistant or permission. Introduction to professional aspects of sociology and major areas of study/research in the field. Not approved as credit toward a degree. Seminar. Credit/Noncredit.
- 602 FAMILY AND SOCIETY** 3 credits  
Examination of the interplay of family and society; family as both independent/dependent variable, at micro/macro levels. Development and impact of family policies is discussed.
- 603 SOCIOLOGICAL RESEARCH METHODS** 3 credits  
Advanced research methods including advanced statistical techniques. Lecture/laboratory.
- 604 SOCIAL RESEARCH DESIGN** 3 credits  
Intensive analysis of problems in a research design, i.e., those encountered in thesis preparation. Seminar or dissertation.
- 607 COMPUTER APPLICATIONS IN SOCIAL SCIENCES** 3 credits  
Prerequisite: elementary statistics course or permission of instructor. Introduction to computers and their applications in social sciences. (Same as KSU 72214) Seminar.
- 613 SOCIOLOGY OF PROGRAM EVALUATION AND PROGRAM IMPROVEMENT** 3 credits  
Prerequisite: permission. Program evaluation as it occurs in different social programs. Topics include history evaluation, value assumptions, political dimensions, ethical issues, social change, use of experimentation and alternatives and the use for program development. Seminar.
- 615 EPIDEMIOLOGIC METHODS IN HEALTH RESEARCH** 3 credits  
Prerequisite: permission. Designed to introduce the student to methods of developing and understanding information concerning the distribution of illness and injury in society and evaluations of interventions to reduce the burden.
- 617 SOCIOLOGICAL THEORY** 3 credits  
Examination of the classical theoretical statements that form the foundation of sociological theory. Emphasis on classic sociological theory and its contributions to contemporary theory and research. Seminar.
- 620 GENERAL SYSTEMS THEORY** 3 credits  
Analysis of general systems theory as basis for a model of society and as heuristic framework for theory and research. (Same as KSU 72108) Seminar.
- 631 SOCIAL PSYCHOLOGY** 3 credits  
Intensive examination of social psychological theory and research, both classic and contemporary. Provides student with background and working knowledge of social psychological aspects of social phenomena. (Same as KSU 72430) Seminar.
- 632 SMALL GROUP THEORY** 3 credits  
Prerequisite: permission. Theoretical and applied aspects of small group dynamics. Topics include leadership emergence, effective group development and functioning, power, norms and individual behavior, among others. (Same as KSU 72432) Seminar.
- 634 PERSONALITY AND SOCIAL SYSTEMS** 3 credits  
Examination of contemporary theory and research on linkages between personality and society. Some applications in studies of modernization, social class and occupations and sex roles. (Same as KSU 72433) Seminar.
- 635 SOCIOLOGY OF COMMUNICATION** 3 credits  
Examination of communication media, content, audiences and impact within sociological context. (Same as KSU 72434) Seminar.
- 636 CRITIQUE OF MASS COMMUNICATIONS RESEARCH** 3 credits  
Prerequisite: permission. Systematic evaluation of theoretical, methodological and empirical aspects of significant studies of mass communication. (Same as KSU 72876) Seminar.
- 639 SOCIOLOGY OF GENDER** 3 credits  
Prerequisite: permission. Examination of theories and research on gender origins, characteristics and changes. Emphasizes recent empirical research on gender role patterns and processes in various industrial societies.
- 645 SOCIAL ORGANIZATION** 3 credits  
General survey of major theories, concepts and problems pertaining to creation, alteration and dissolution of social organization at various levels of size and complexity. (Same as KSU 72540) Seminar.
- 646 SOCIAL STRATIFICATION** 3 credits  
Prerequisite: permission. Seminar dealing with social class and castes with special reference to American social structure. (Same as KSU 72546) Seminar.
- 648 COMPLEX ORGANIZATIONS** 3 credits  
Prerequisite: permission. Organizations as social systems; their effect on individuals. Problems of professionals in bureaucracies. (Same as KSU 72545) Seminar.
- 649 SOCIOLOGY OF WORK** 3 credits  
Examination of work as behavioral phenomenon in human societies; contrasts with non-work and leisure; significance of occupations, professional and work types in organization of work. (Same as KSU 72542) Seminar.
- 651 SEMINAR IN RACE RELATIONS** 3 credits  
Prerequisite: permission. Analysis of the structure and dynamics of race and ethnic relations with attention given to both historical and contemporary issues. (Same as KSU 72870) Seminar.
- 652 CONFLICT** 3 credits  
Prerequisite: permission. Current conceptions of human conflict. Discussion of vital concepts and principles for understanding conflict phenomena. Power, values, ideology, riots, revolution and war. (Same as KSU 72875) Seminar.
- 656 MEDICAL SOCIOLOGY** 3 credits  
Prerequisite: permission of instructor. A general survey of the field of medical sociology with special emphasis on application of sociological concepts and methods as tools to aid in the analysis of health and health care in the contemporary urban United States. (Same as KSU 72323).
- 657 URBAN HEALTH CARE** 3 credits  
Prerequisite: permission. Relationships between urban social structures and processes and organization and functioning of health-care delivery systems in urbanized nations. Seminar.
- 658 FIELD RESEARCH IN URBAN LIFE STYLES** 3 credits  
Prerequisite: permission. Examination of various life styles in contemporary urban society. Explores issues of theory and methodology in urban life-styles research through evaluation of both classic and contemporary studies. Includes application of concepts and techniques in actual field research. Seminar.
- 663 DEVIANCE AND DISORGANIZATION** 3 credits  
Prerequisite: permission. Examination of nature and types of deviance. Problems and issues in theory and research. (Same as KSU 72760) Seminar.
- 664 SOCIOLOGY OF CRIMINAL BEHAVIOR** 3 credits  
Analysis of relationship of crime and delinquency to social structure and social processes. Responses by criminal justice agencies. Seminar.
- 665 JUVENILE DELINQUENCY: THEORY AND RESEARCH** 3 credits  
Prerequisite: permission. Analysis of theories of delinquency; ecological, class structural, sub-structural, etc. Review of relevant research also presented. Seminar.
- 666 SOCIOLOGY OF CORRECTIONS** 3 credits  
Prerequisite: permission. Analysis of correctional institution as social system; its formal structure and informal dynamics. Analysis of present state of corrections research. Seminar.
- 677 FAMILY ANALYSIS** 3 credits  
Prerequisite: permission. Analysis and evaluation of sociological theory and research in the family. Concentration on techniques of theory construction and research design in sociological study of the family. (Same as KSU 72543) Seminar.
- 678 SOCIAL GERONTOLOGY** 3 credits  
Prerequisite: permission. Impact of aging upon individuals and society. Reactions of individuals and society to aging. (Same as KSU 72877) Seminar.
- 679 POLITICAL SOCIOLOGY** 3 credits  
Description, analysis and interpretation of political behavior through application of sociological concepts. (Same as KSU 72544) Seminar.
- 680 SOCIOLOGY OF EDUCATION** 3 credits  
Selected problems in sociological analysis of educational systems. Emphasis on such social determinants of learning as class, race, family and peer subcultures. (Same as KSU 72547) Seminar.
- 681 CROSS CULTURAL PERSPECTIVES IN AGING** 3 credits  
Prerequisite: permission. A comparison of aging in various cultures and societies around the world.
- 686 POPULATION** 3 credits  
Analysis of basic population theory and methods. Trends and differentials in fertility, mortality, migration and selected social demographic variables also considered. (Same as KSU 72656) Seminar.
- 687 SOCIAL CHANGE** 3 credits  
Advanced seminar in theories of social change. (Same as KSU 72320) Seminar.
- 688 HUMAN ECOLOGY** 3 credits  
Selected problems in analysis of social behavior in relation to physical environment. Overview of theory, methods and applications of human ecology. (Same as KSU 72650) Seminar.
- 689 URBAN ECOLOGY** 3 credits  
Seminar in theory and measurement of social ecology of urban areas. Emphasis on trends and differentials in distribution of social and organizational behavior in urban America. Seminar.
- 697 READINGS IN CONTEMPORARY SOCIOLOGICAL LITERATURE** 1-3 credits  
Prerequisites: seven credits of sociology and permission of adviser, instructor and head of department. Intensive reading and interpretation of written material in student's chosen field of interest. Regular conferences with instructor.
- 698 DIRECTED RESEARCH** 1-3 credits  
(May be repeated) Prerequisite: permission. Empirical research to be conducted by the student under graduate faculty supervision.
- 699 MASTER'S THESIS** 2-5 credits  
(May be repeated for a total of six credits) Prerequisite: permission. Supervised thesis writing.
- 700 COLLEGE TEACHING OF SOCIOLOGY** 2 credits  
Prerequisite: teaching assistant or permission. Training and experience in college teaching of sociology. Not approved as credit toward a degree. Seminar.
- 705 THEORY AND MEASUREMENT OF SOCIAL ATTITUDES** 3 credits  
Prerequisites: 603 and 604, or permission. Seminar in theories of social attitudes and techniques for their measurement. (Same as KSU 72213) Seminar.
- 706 MULTIVARIATE TECHNIQUES IN SOCIOLOGY** 3 credits  
Prerequisites: 603 and 604, or permission; a sociology graduate student only. Methodological problems using advanced multivariate techniques in analysis of sociological data. Topics include nonexperimental causal analysis such as recursive and nonrecursive path analysis. (Same as KSU 72217).
- 707 MEASUREMENT IN SOCIOLOGY** 3 credits  
Prerequisite: 706 or permission. Theory and methods of measurement reliability and validity in social data. Topics include estimating reliability and validity, scale and item design, alternative measurement strategies, measurement models. Seminar.
- 708 ADVANCED TECHNIQUES IN RESEARCH** 1-3 credits  
Prerequisite: permission. Selected topics in advanced, multivariate statistical analysis and in strategies of sociological research. Emphasis on current trends and innovations in research techniques. (Same as KSU 72216) Seminar.
- 709 ANALYSIS OF SOCIOLOGICAL DATA** 3 credits  
Prerequisite: 706 or permission. Critical examination of data analysis techniques having particular relevance to research problems in sociology. (Same as KSU 72218) Seminar.
- 710 SOCIAL SAMPLING** 3 credits  
Prerequisites: 603, 604 or permission. Theory and methods of sampling in sociology. Topics include sample design, sampling efficiency, nonresponse, mortality in longitudinal designs, urban, organizational, and survey sampling, stratified and cluster sampling. Seminar.
- 711 SURVEY RESEARCH METHODS** 3 credits  
Prerequisites: 603 and 604, or permission. In-depth study of design and administration of social surveys. (Same as KSU 72220) Seminar.
- 712 EXPERIMENTAL AND QUASI-EXPERIMENTAL RESEARCH IN SOCIOLOGY** 3 credits  
Prerequisites: 603, 604 or permission. Application of experimental and quasi-experimental methods in sociological research with special attention given to appropriate designs, statistical analyses and empirical literature. Seminar.
- 714 QUALITATIVE METHODOLOGY** 3 credits  
Prerequisites: 603, 604 or permission. Theory building and theory testing through the application of such techniques as participant-observation, open-ended interviewing, content analysis, historiography (diaries, records from churches, schools, social agencies, and other contemporary sources) and qualitative statistics. (Same as KSU 72219) Seminar.

- 718 THEORY CONSTRUCTION** 3 credits  
Study of rules and methods for constructing scientific theory. Emphasis on writings of scientists and philosophers of science and application of these ideas to development of sociological theories. (Same as KSU 72107) Seminar.
- 721 SPECIAL TOPICS IN SOCIOLOGICAL THEORY** 1-3 credits  
Open course to cover content area not readily subsumable under other headings. Content of course to be determined by instructor. (Same as KSU 72195) Seminar.
- 722 EARLY SOCIOLOGICAL THOUGHT** 3 credits  
Prerequisite: 617 or permission. Two to four major sociological thinkers prior to 1930 examined in depth. Specific persons considered will be chosen by instructor but will be announced well in advance of beginning of class. (Same as KSU 72191) Seminar.
- 723 SEMINAR IN SOCIOLOGICAL THEORY** 3 credits  
Prerequisite: 722 or permission. Intensive, critical analysis of current scholarship in a broad range of contemporary sociological theories. Virtually all required reading will be from primary sources. (Same as KSU 72105) Seminar.
- 725 SOCIOLOGY OF HEALTH BEHAVIORS** 3 credits  
Sociological analysis of the major theories and research on health and illness and the utilization of health services. (Same as KSU 72325)
- 726 STRATIFICATION AND HEALTH** 3 credits  
Race, social class, and gender differences in physical and mental health status, help-seeking behavior, and health care. Race, class, and gender stratification of health care workers. (Same as KSU 72328)
- 727 SOCIOLOGY OF OCCUPATIONS, PROFESSIONS AND HEALTH CARE** 3 credits  
Sociological examination of the organization of work in the health care field with emphasis on occupations, professions, and health care delivery. (Same as KSU 72327)
- 728 SOCIOLOGY OF MENTAL HEALTH AND MENTAL DISORDERS** 3 credits  
Sociological examination of the social processes that affect mental health, that frame cultural ideas of normality and illness, and that define clinical pathology. (Same as KSU 72326)
- 733 SMALL GROUP RESEARCH TECHNIQUES** 3 credits  
Prerequisite: 632. Application and implications of research in small groups. Focus on both laboratory and field studies. Seminar/laboratory.
- 737 CONTEMPORARY TRENDS IN SOCIAL PSYCHOLOGY** 1-3 credits  
Selected topics on significant contemporary issues, theories and methodological developments in social psychology. (Same as KSU 72495) Seminar.
- 738 RESEARCH IN SOCIAL PSYCHOLOGY** 1 credit  
Prerequisite: 631. Design and development of a research project oriented to empirically examining selected concepts in social psychology or to testing selected propositions in social psychology. (Same as KSU 72431) Research.
- 747 URBAN SOCIOLOGY** 3 credits  
Analysis of theories of urban process and review of major contributions to empirical analysis of urban life. (Same as KSU 72659) Seminar.
- 750 RESEARCH IN COMMUNITY AND AREA PROBLEMS** 3 credits  
Prerequisite: permission. Special investigation of community, area or regional problems; design and execution of small projects. (Same as KSU 72655) Seminar.
- 753 SPECIAL TOPICS IN SOCIAL ORGANIZATION** 1-3 credits  
Open course to cover content area not readily subsumable under other headings. Content of course to be determined by instructor. (Same as KSU 72596) Seminar.
- 754 ISSUES IN URBAN ANALYSIS** 1-3 credits  
Special topics seminar dealing with current and special topics in urban process and its analysis. Seminar.
- 755 RESEARCH IN SOCIAL ORGANIZATION** 1 credit  
Prerequisite: 645. Design and development of a research project oriented to empirically examining selected concepts in social organization or to testing selected propositions in social organization. (Same as KSU 72541) Research.
- 756 SEMINAR IN URBAN PROCESSES** 3 credits  
Prerequisite: Ph.D. standing in sociology or permission. Critical examination of current research and theory related to urban life; special emphasis on social change in urban environment. (Same as KSU 72691) Seminar.
- 767 SPECIAL TOPICS IN DEVIANCE AND DISORGANIZATION** 1-3 credit  
Designed to meet needs of student with interest in selected topics in deviance and disorganization. (Same as KSU 72795) Seminar.
- 768 RESEARCH IN DEVIANCE AND DISORGANIZATION** 1 credit  
Prerequisite: 663. Provides for analysis of research problems in deviance and disorganization and for development of research project in above area. (Same as KSU 72761) Research.
- 790 CONTEMPORARY ISSUES IN SOCIAL CHANGE** 1-3 credits  
Prerequisite: 687 or permission. Varying topics focusing on current research and theory in field of social change. Advanced notice in specific content will be provided by instructor. (Same as KSU 82329) Seminar.
- 791 RESEARCH IN SOCIAL CHANGE** 1 credit  
Prerequisite: 687. Continuation of 687 Student prepares a major research paper based on theoretical material covered in 790 and presents it for discussion to the seminar. Research.
- 792 RESEARCH IN HUMAN ECOLOGY** 1 credit  
Prerequisite: 688. Intensive research on selected aspect of human ecology by individual student with previous training in this area. Topic to be arranged between student and instructor. Research.
- 797.8 INDIVIDUAL INVESTIGATION** 1-3 credits each  
Prerequisites: one semester of graduate work, permission of instructor, adviser and head of department. Readings and/or research supervised by member of graduate faculty. (Same as KSU 72896)
- 899 DOCTORAL DISSERTATION** 1-10 credits  
(Must be repeated for a minimum of 30 credits) Dissertation. (Same as KSU 82199)
- 557 CULTURE AND MEDICINE** 3 credits  
Prerequisite: 150 or permission of instructor. Analyzes various aspects of Western and non-Western medical systems from an anthropological perspective. Compares traditional medical systems around the world.
- 561 LANGUAGE AND CULTURE** 3 credits  
Prerequisite: 150 or permission. Examination of language structure and interaction of language, cognition and culture. Lecture.
- 563 SOCIAL ANTHROPOLOGY** 3 credits  
Prerequisite: 150 or permission. Comparative structural analysis of non-Western systems of kinship and social organization in terms of status, role, reciprocal expectation, nomenclature, nuclear and extended households and other kinship groupings. Lecture.
- 572 SPECIAL TOPICS: ANTHROPOLOGY** 3 credits  
(May be repeated) Prerequisites: 150 and permission. Designed to meet needs of student with interests in selected topics in anthropology. Offered irregularly when resources and opportunities permit. May include archaeological field school, laboratory research or advanced course work not presently offered by department on regular basis.
- 594 WORKSHOP IN ANTHROPOLOGY** 1-3 credits  
(May be repeated) Group studies of special topics in anthropology. May not be used to meet departmental undergraduate or graduate major requirements. May be used for elective credit only.
- 651 SEMINAR IN ANTHROPOLOGICAL THEORIES AND METHODS** 3 credits  
Major theoretical viewpoints in cultural anthropology. Nature, scope of research problems. Survey of methods in field work. Seminar.
- 697 INDIVIDUAL INVESTIGATION** 1-3 credits  
Prerequisites: permission of instructor and head of department. Intensive reading and/or research in student's chosen field of interest. Regular conferences with instructor. Preparation of a research paper.

## PUBLIC ADMINISTRATION AND URBAN STUDIES

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### 3980:

- 590 WORKSHOP** 1-3 credits  
(May be repeated) Group studies of special topics in urban studies. May not be used to meet graduate major requirements in urban studies. May be used for elective credit only.
- 600 BASIC ANALYTICAL RESEARCH** 3 credits  
Prerequisite: permission. Examines basic framework of social science research methodologies and basic complementary statistical techniques, including probability and sampling most useful in urban studies.
- 601 ADVANCED RESEARCH AND STATISTICAL METHODS** 3 credits  
Prerequisite: 600. Extends study of social science to include more advanced research designs and multivariate statistical techniques.
- 602 HISTORY OF URBAN DEVELOPMENT** 3 credits  
Examination of major literature on processes of urbanization in United States and selected facets of urban institutional development.
- 610 LEGAL FOUNDATIONS OF PUBLIC ADMINISTRATION** 3 credits  
Prerequisite: permission. Introduction to the legal foundations and context of public administration, including the interaction of the course, public organizations, public administration and the public.
- 611 INTRODUCTION TO THE PROFESSION OF PUBLIC ADMINISTRATION** 3 credits  
Prerequisite: permission. Introduction to the theory and practice of the field of public administration. Foundation course for later MPA study.
- 612 NATIONAL URBAN POLICY** 3 credits  
Prerequisite: permission. Major federal policies that relate to urban problems examined in regard to policy-making processes, implementation and impact.
- 613 INTERGOVERNMENTAL MANAGEMENT** 3 credits  
Prerequisite: permission. Examines the field of intergovernmental relations as it applies to urban administration and management.
- 614 ETHICS AND PUBLIC SERVICE** 3 credits  
Prerequisite: permission. Examination of the ethical problems and implications of decisions and policies made by those whose actions impact on the broad public. Case studies of decision making in both the public (government) and private (business and the professions) spheres, are studied in relation to classical literature in ethical theory.
- 615 PUBLIC ORGANIZATION THEORY** 3 credits  
Prerequisites: 611 and 610 or equivalent. Examines the development of public organizational theory and the current status of theoretical developments in the field of public administration.
- 616 PERSONNEL MANAGEMENT IN THE PUBLIC SECTOR** 3 credits  
Fundamental issues and principles of public sector personnel administration, including recruitment, selection, training, motivation, supervision, evaluation, labor relations and affirmative action.
- 617 LEADERSHIP AND DECISION-MAKING** 3 credits  
Examines the context of public organizational management including relevant organizational theories, strategic management and planning and public sector leadership.
- 618 CITIZEN PARTICIPATION** 3 credits  
The fundamental theory, background, techniques, and issues of citizen participation in urban policy-making.
- 620 SOCIAL SERVICES PLANNING** 3 credits  
Prerequisite: permission. In-depth analysis of total social services requirements and various ways in which social services planning function is carried out in urban communities.
- 621 URBAN SOCIETY AND SERVICE SYSTEMS** 3 credits  
Prerequisite: permission. Analysis of social bases of urban society; hierarchies, social problems, relationships to planning, public services.
- 622 URBAN PLANNING AND HEALTH CARE** 3 credits  
Basic knowledge of the health service delivery system is provided for planners and administrators in the public sector.
- 623 PUBLIC WORKS ADMINISTRATION** 3 credits  
Prerequisite: permission. Examines the building, maintenance and management of public works.

## ANTHROPOLOGY

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### 3870:

- 505 HISTORY AND THEORY IN ANTHROPOLOGY** 3 credits  
Prerequisite: 150 or permission. Survey of theories and problems in social and cultural anthropology. Historical development, methods of inquiry and contemporary theoretical perspectives.
- 555 CULTURE AND PERSONALITY** 3 credits  
Prerequisite: 150 or permission. Examination of functional and causal relationships between culture and individual cognition and behavior. Lecture.

- 636 PARKS AND RECREATION** 3 credits  
Prerequisite: permission. Deals with theory, practice, evaluation of recreational administration, parks planning.
- 640 FISCAL ANALYSIS** 3 credits  
Prerequisite: permission. Study of revenue and expenditure patterns of the city's government.
- 641 URBAN ECONOMIC GROWTH AND DEVELOPMENT** 3 credits  
Prerequisite: permission. Examination of urban economic unit and its susceptibility to social, economic, political and physical change.
- 642 PUBLIC BUDGETING** 3 credits  
Prerequisite: permission. Current professional practice and theoretical issues in public budgeting and management of capital and operating budgets.
- 643 INTRODUCTION TO PUBLIC POLICY** 3 credits  
Prerequisite: permission. Introduction to models of public policy formulation; identification of major policy issues; and the analysis of policy implementation and policy impact.
- 650 COMPARATIVE URBAN SYSTEMS** 3 credits  
Prerequisite: permission. Conceptual schemes and methodology for comparative urban analysis among a number of major cities selected from each continent.
- 670 RESEARCH FOR FUTURES PLANNING** 3 credits  
Prerequisites: 600 and 601 and completion of eight credits of core curriculum in urban studies. An overview of the techniques associated with the field of futures research and their application to long-term urban planning.
- 671 PROGRAM EVALUATION IN URBAN STUDIES** 3 credits  
Prerequisite: 600 or equivalent. Major considerations appropriate for conducting evaluations of a wide variety of human service programs and policies affecting urban and metropolitan areas.
- 672 ALTERNATIVE URBAN FUTURES** 3 credits  
Overview of topics and issues associated with alternative urban futures and their implications for planning and public policy in urban communities.
- 673 COMPUTER APPLICATIONS IN PUBLIC ORGANIZATIONS** 3 credits  
Prerequisite: 600 and 601. Introduction to microcomputer applications in the public sector, including data entry, statistical analysis, report writing, graphical representation and spreadsheets.
- 674 ANALYTICAL TECHNIQUES FOR PUBLIC ADMINISTRATORS** 3 credits  
Prerequisite: 600. Public sector applications of quantitative methods, including decision analysis, queuing theory, mathematical programming, and simulation.
- 680.1 SELECTED TOPICS IN URBAN STUDIES** 1-3 credits each  
Prerequisite: permission. Selected topics in specific areas of urban planning, in various developmental processes of cities, or in various urban policy and administrative issues. (A maximum of 27 credits may be earned in 680 and 681.)
- 690 URBAN STUDIES SEMINAR** 3 credits  
Prerequisites: 16 credits of urban studies core plus quantitative methods. Urban research methods applied to specific urban research area. Comprehensive paper required.
- 695 INTERNSHIP** 1-3 credits  
(May be repeated for a total of three credits) Prerequisite: permission. Faculty-supervised work experience in which student participates in policy planning, administrative operations in selected urban, state and federal governments and urban agencies.
- 697 INDIVIDUAL STUDIES** 1-3 credits  
(May be repeated for a total of four credits) Directed individual readings or research on specific area or topic.
- 699 MASTER'S THESIS** 1-9 credits  
Prerequisite: permission. Supervised thesis writing. (May be repeated for a total of nine credits.)
- 700 ADVANCED RESEARCH METHODS I** 3 credits  
Prerequisite: master's level statistics or permission. Introduction to statistical techniques and methodologies in doctoral and postdoctoral research. Emphasis on conceptual and mathematical interrelationships.
- 701 ADVANCED RESEARCH METHODS II** 3 credits  
Prerequisite: 700 or equivalent. Continuation of 700. Emphasis placed upon conceptual and mathematical interrelationships of multivariate statistical techniques as well as application of these techniques through computer analysis of urban data sets.
- 702 URBAN THEORY I** 3 credits  
Prerequisite: permission. Review of major theoretical tradition examining urban problems; for students entering the doctoral program in urban studies (first in two-course sequence).
- 703 URBAN THEORY II** 3 credits  
Prerequisite: 702. Review of major professional disciplines dealing with urban problems; for students entering the doctoral program in urban studies (second in two-course sequence).
- 704 PUBLIC BUREAUCRACY** 3 credits  
Prerequisite: permission. Analysis of bureaucratic operations in the implementation of public policy, including special attributes of human service organizations and the democratic theory debate.
- 705 ECONOMICS OF URBAN POLICY** 3 credits  
Prerequisite: master's level knowledge of macroeconomics and microeconomics or special permission. Use of research tools of economic analysis in seminar format to examine options available to urban policy makers in operation of public services and economic development of cities.
- 706 PROGRAM EVALUATION** 3 credits  
Prerequisite: permission. Advanced treatment of topics in program evaluation.
- 707 URBAN PLANNING AND MANAGEMENT STRATEGIES** 3 credits  
Prerequisite: permission. Analysis of urban planning policy issues and strategies for implementation in public policy formulation. Emphasis on use of planning process as integrative mechanism.
- 708 URBAN POLICY: THE HISTORICAL PERSPECTIVE** 3 credits  
Prerequisite: permission. Critical examination of major ideas about the city from Aristotle to the 20th Century and of the impact on urbanization on society and public policy.
- 709 SYSTEMS AND PROCESSES OF POLICY ANALYSIS** 3 credits  
Prerequisite: permission. Analysis of administrative processes within public organizations, federal, state and local in the United States; emphasis on urban community.
- 711 SEMINAR IN PUBLIC ADMINISTRATION** 3 credits  
Prerequisite: permission. In depth review and critique of major intellectual traditions, concepts and theories underlying public administration in the United States.
- 714 SEMINAR IN POLICY ANALYSIS AND EVALUATION** 3 credits  
Prerequisite: permission. In depth review and critique of major intellectual traditions, concepts and theories underlying policy analysis and evaluation in the United States.
- 715 SEMINAR IN URBAN AND REGIONAL PLANNING** 3 credits  
Prerequisite: permission. In depth review and critique of major intellectual traditions, concepts and theories underlying urban and regional planning in the United States.
- 720 COMPARATIVE PLANNING STRATEGIES** 3 credits  
Prerequisite: 715 or permission. Review and analysis of alternative planning theories, institutions, and implementation strategies in a variety of national settings.
- 799 URBAN TUTORIAL** 3 credits  
Prerequisite: permission. Intensive study of a particular approved field or typical area of urban studies under the supervision of a tutor.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
(May be repeated) Open to properly qualified student accepted as candidate for Doctor of Philosophy degree. Student must register for at least three credits each semester until dissertation is accepted. Minimum of 15 credits required.

# College of Engineering

## CHEMICAL ENGINEERING 4200:

- 561 SOLIDS PROCESSING** 3 credits  
Prerequisites: 321 and 353 or permission. Comprehensive problems in sedimentation, fluidization, drying and other operations involving mechanics of particulate solids in liquid and gas continua.
- 563 POLLUTION CONTROL** 3 credits  
Prerequisite: 353 or permission. Air and water pollution sources and problems. Engineering aspects and methodology.
- 566 DIGITIZED DATA AND SIMULATION** 3 credits  
Prerequisite: permission. Data acquisition and analysis by digital devices, digital control applications and design.
- 570 ELECTROCHEMICAL ENGINEERING** 3 credits  
Prerequisites: 322, 330. Chemical engineering principles as applied to the study of electrode processes and to the design of electrochemical reactors. Topics include electrochemical thermodynamics, cell polarizations, Faraday's Laws, electrode kinetics, transport processes in electrochemical systems, current distributions, reactor design, experimental methods, commercial processes, and batteries and fuel cells.
- 572 SEPARATION PROCESSES IN BIOCHEMICAL ENGINEERING** 3 credits  
Prerequisite: 353. Introduction to the separation and purification techniques pertinent to bioprocesses, with emphasis on the engineering considerations for large-scale operations.
- 600 TRANSPORT PHENOMENA** 3 credits  
Prerequisite: 322 or permission. Systematic presentation of conservation of momentum, energy and mass at microscopic and macroscopic levels in conjunction with illustrative examples and analogies.
- 605 CHEMICAL REACTION ENGINEERING** 3 credits  
Prerequisite: 330 or permission. Kinetics of homogeneous and heterogeneous systems. Reactor design for ideal and non-ideal flow systems.
- 610 CLASSICAL THERMODYNAMICS** 3 credits  
Prerequisite: 225. Discussion of laws of thermodynamics and their application. Prediction and correlation of thermodynamic data. Phase and reaction equilibria.
- 622 BIOCHEMICAL ENGINEERING** 3 credits  
Application of chemical engineering principles to biological processes which produce desirable compounds or destroy unwanted or hazardous substances.
- 630 CHEMICAL PROCESS DYNAMICS** 3 credits  
Prerequisite: 600. Development and solutions of mathematical models for chemical processes including models based on transport phenomena principles, population balance methods and systems analysis.
- 631 CHEMICAL ENGINEERING ANALYSIS** 3 credits  
Prerequisites: 322, 225, 330. Mathematical analysis of problems in transport processes, chemical kinetics and control systems. Solution techniques for these problems and their practical significances are stressed. Heuristic proofs will be given for necessary theory developments.
- 632 NONLINEAR DYNAMICS AND CHAOS** 3 credits  
Prerequisite: 3450/235. Description and analysis of the complex behavior exhibited by nonlinear equations. Emphasis is on the numerical methods to quantify chaos.
- 634 APPLIED SURFACTANT SCIENCE** 3 credits  
Prerequisite: 610. The basics of surfactant science, the chemical engineering application of surfactants including use in polymerization media, separations, emulsion, microemulsion, and a rheology modifier.
- 635 ADVANCED POLYMER ENGINEERING** 3 credits  
Prerequisite: 322 or 600 or permission. Reactors for polymerization, polymer characterization, polymer processing, polymer rheology.
- 640 ADVANCED PLANT DESIGN** 3 credits  
Prerequisite: permission. Topical treatment of process and equipment design, scale-up, optimization, process syntheses, process economics. Case problems.
- 680 HETEROGENOUS CATALYSIS** 3 credits  
Prerequisite: 330. Kinetics and mechanisms of heterogeneous and homogeneous catalytic reactions; characterization and design of heterogeneous catalysts.
- 696 TOPICS IN CHEMICAL ENGINEERING** 1-3 credits  
(May be repeated for a total of six credits) Prerequisite: permission. Topics selected from new and developing areas of chemical engineering, such as electrochemical engineering, coal and synthetic fuels processing, bioengineering, simultaneous heat and mass transfer phenomena and new separation techniques.
- 698 MASTER'S RESEARCH** 1-6 credits  
Prerequisite: Permission of advisor. (May be repeated.) Research on a suitable topic in chemical engineering culminating in a master's thesis.
- 699 MASTER'S THESIS** 1-6 credits  
(May be repeated to a maximum of six credits) For properly qualified candidate for master's degree. Supervised original research in specific area of chemical engineering selected on basis of availability of staff and facilities.
- 701 ADVANCED TRANSPORT PHENOMENA** 3 credits  
Prerequisite: 600. Advanced theory of transport phenomena such as applied tensor analysis, constitutive equations, multicomponent reactive transport and multiphase transport. Illustrative practical examples presented.
- 702 MULTIPHASE TRANSPORT PHENOMENA** 3 credits  
Prerequisite: 600. General transport theorem, kinematics, Cauchy's lemmas and the jump boundary conditions are developed followed by the theory of volume averaging. The single phase equations are then volume averaged to obtain the multiphase equations of change. The technique for using these equations and their practical significance is also covered.
- 706 ADVANCED REACTION ENGINEERING** 3 credits  
Prerequisite: 605. Kinetics of heterogeneous systems, steady and unsteady state mathematical modeling of chemical reactors, fluidization and additional topics drawn from current literature.

- 711 ADVANCED CHEMICAL ENGINEERING THERMODYNAMICS** 3 credits  
Prerequisite: 610. Advanced topics in thermodynamics, including phase and reaction equilibria at high pressures, phase equilibrium for multiphase systems, reaction equilibria in multiphase systems, thermodynamics of surfaces, thermodynamics of systems under stress, non-equilibrium thermodynamics and current topics from literature.
- 715 MOMENTUM TRANSPORT** 3 credits  
Prerequisite: 600. Discussion of potential flow, boundary layer formation and turbulent flow phenomena for Newtonian fluids.
- 716 NON-NEWTONIAN FLUID MECHANICS** 3 credits  
Prerequisite: 600. Tensor and curvilinear coordinates. Newtonian viscometrics. Development of non-Newtonian constitutive equations. Special and general flows of various constitutive models.
- 720 ENERGY TRANSPORT** 3 credits  
Prerequisite: 600. Conduction, natural and forced convection, and radiation heat transfer starting with equations of continuity, motion and energy.
- 721 TOPICS IN ENERGY TRANSPORT** 3 credits  
Prerequisite: 720. Advanced analytical and graphical methods for solving complex heat transfer problems found in chemical engineering.
- 725 MASS TRANSFER** 3 credits  
Prerequisite: 600. Theory of mass transfer with applications to absorption, adsorption, distillation and heterogeneous catalysis.
- 731 PROCESS CONTROL** 3 credits  
Prerequisite: 630. Introduction to modern control theory of chemical processes including cascade control, multivariate control and data sampled control.
- 736 POLYMER ENGINEERING TOPICS** 3 credits  
Prerequisite: permission. Selected topics of current interest in polymer engineering, such as modeling of reactors or processes, multiphase materials, multiphase flow, artificial fiber engineering, etc.
- 738 CHEMICAL PROCESSING OF ADVANCED MATERIALS** 3 credits  
Prerequisite: 605. Advanced materials such as ceramics, optical materials, sensors, catalysts; application of reaction engineering to sol-gel processing, ceramic processing, modified chemical vapor deposition.
- 742 ADVANCED CATALYST DESIGN** 3 credits  
Prerequisite: 605. Development of catalysis theory and its application to the design of practical catalysts.
- 750 ADVANCED POLLUTION CONTROL** 3 credits  
Prerequisite: 463 or permission. Analysis of current environmental research in analytical instrumentation, air and water, pollution control, hazardous waste treatment, and nuclear waste disposal.
- 794 ADVANCED SEMINAR** 1-4 credits  
(May be repeated for a total of six credits) Prerequisite: permission of department head. Advanced projects, readings and other studies in various areas of chemical engineering. Intended for student seeking Ph.D. in engineering.
- 898 PRELIMINARY RESEARCH** 1-15 credits  
(May be repeated for a total of 15 credits.) Prerequisite: approval of dissertation director. Preliminary investigations prior to the submission of a dissertation proposal to the Interdisciplinary Doctoral Committee.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
(May be taken more than once.) Prerequisite: acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student.

## CIVIL ENGINEERING 4300:

- 514 DESIGN OF EARTH STRUCTURES** 3 credits  
Prerequisite: 314 or permission. Design of earth structures; dams, highway fills, cofferdams, etc. Embankment construction techniques, quality control, embankment analysis, instrumentation, foundation soil stabilization, seepage analysis and control. Design problem. Graduate students will perform more advanced analysis and design.
- 518 SOIL AND ROCK EXPLORATION** 3 credits  
Prerequisite: 314 or permission. Site exploration criteria and planning. Conventional boring, sampling and in situ testing methods. Theory and application of geophysics and geophysical methods including seismic, electrical resistivity, gravity, magnetic and radioactive measurements. Air photo interpretation.
- 523 CHEMISTRY FOR ENVIRONMENTAL ENGINEERS** 3 credits (2 lecture - 1 lab)  
Prerequisite: One year of college chemistry. General, physical, organic, biochemistry, equilibrium, and colloid chemistry concepts applied to environmental engineering. Concepts are used in water and wastewater laboratory.
- 526 ENVIRONMENTAL ENGINEERING DESIGN** 3 credits  
Prerequisite: 323. An introduction to the physical, chemical and biological processes utilized in the treatment of water and wastewater, with design parameters emphasized.
- 527 WATER QUALITY MODELING AND MANAGEMENT** 3 credits  
Prerequisite: 323. Analysis and simulation of the physical, chemical and biochemical processes affecting stream quality. Development of management strategies based upon the application of water quality modeling techniques to environmental systems.
- 528 HAZARDOUS AND SOLID WASTES** 3 credits  
Prerequisite: senior standing or permission of instructor. Hazardous and solid waste quantities, properties and sources are presented. Handling, processing, storage and disposal methods are discussed with non-technical constraints outlined.
- 543 APPLIED HYDRAULICS** 3 credits  
Prerequisite: 341. Review of design principles; urban hydraulics, steam channel mechanics, sedimentation, coastal engineering.
- 551 COMPUTER METHODS OF STRUCTURAL ANALYSIS** 3 credits  
Structural analysis using microcomputers; finite element software, interactive graphics; beam stiffness concepts and matrix formulation; simple and complex structural systems modeling; vibration analysis.
- 553 OPTIMUM STRUCTURAL DESIGN** 3 credits  
Prerequisite: 306. Basic concepts in structural optimization. Mathematical programming methods including unconstrained minimization, multidimensional minimization and constrained minimization.

- 554 ADVANCED MECHANICS OF MATERIALS** 3 credits  
Prerequisite: 202 or equivalent. Three-dimensional state of stress and strain analysis. Unsymmetric bending of straight and curved members with shear deformation. Beams on elastic foundations. Saint Venant's torsional problems. Inelastic analysis of bending and torsional members. Introduction to energy method. Instability behavior of prismatic members.
- 563 TRANSPORTATION PLANNING** 3 credits  
Prerequisite: 361. Theory and techniques for development, analysis and evaluation of transportation system plans. Emphasis on understanding and using tools and professional methods available to solve transportation planning problems, especially in urban areas.
- 564 HIGHWAY DESIGN** 3 credits  
Prerequisite: 361. Study of modern design of geometrical and pavement features of highways. Design problem and computer use. Graduate students will produce a more complete design.
- 565 PAVEMENT ENGINEERING** 3 credits  
Prerequisite: 361. Theories of elasticity, of viscoelasticity and of layered systems as applied to pavements. Pavement materials characterization; pavement design, pavement restoration for rigid and flexible pavements.
- 566 TRAFFIC ENGINEERING** 3 credits  
Prerequisite: 361. Vehicle and urban travel characteristics. traffic flow theory, traffic studies, accidents and safety, traffic signs and marking, traffic signal planning, traffic control and transportation administration.
- 567 ADVANCED HIGHWAY DESIGN** 3 credits  
Prerequisite: 564, Autocad, or permission. Computeraided geometric design of highways including survey data input, digital terrain modeling, cross-section templates, horizontal and vertical roadway design, earthwork computations, and advanced topics.
- 568 HIGHWAY MATERIALS** 3 credits  
Prerequisites: 361, 380 or permission. Properties of aggregates, manufacture and properties of portland cement concrete, properties of asphaltic materials, design and testing of hot mix asphalt pavement mixes and of surface treatments. Laboratory preparation of specimens and determination of properties. Graduate student requirement. Graduate students will be required to perform an additional eight-hour asphalt laboratory (Absorption recovery of asphalt from solution) and to prepare a paper on a highway materials topic.
- 574 UNDERGROUND CONSTRUCTION** 2 credits  
Prerequisite: 314. Description of practices and techniques of underground construction. Selection of proper method for individual job. Design of underground openings, support systems and linings.
- 604 DYNAMICS OF STRUCTURES** 3 credits  
Prerequisite: 306. Approximate, rigorous dynamic analysis of one, two, multiple and infinite degrees of freedom structural systems. Elastoplastic, plastic analysis. Equivalent systems, dynamic hinge concept. Modal analysis. Transfer matrices. Fourier, Laplace transforms.
- 605 STRUCTURAL STABILITY** 3 credits  
Prerequisite: 554 or equivalent. Buckling of bars, beam-columns and frames. Lateral buckling of beams. Double and tangent modulus theories. Energy methods. Compressed rings and curved bars. Torsional buckling. Buckling of plates and shells. Inelastic buckling.
- 606 ENERGY METHODS AND ELASTICITY** 3 credits  
Prerequisite: 202. Work and complementary work. Strain energy and complementary strain energy. Virtual work and Castiglino's theorems. Variational methods. Applications. Formulation of boundary value problems in elasticity. Selected topics in energy methods and elasticity.
- 607 PRESTRESSED CONCRETE** 3 credits  
Prerequisite: 404. Basic concepts. Design of double-tee roof girder; shear; development length; column; piles; design of highway bridge girder; pretensioned, post-tensioned, continuous girders; corbels; volume-change forces; connections.
- 608 MULTISTORY BUILDING DESIGN** 3 credits  
Prerequisite: 401. Floor systems; staggered truss system; braced frame design; unbraced frame design; drift indices; monocoque (tube and partial tube) systems; earthquake design; fire protection. Analysis by STRUDL.
- 609 FINITE ELEMENT ANALYSIS I** 3 credits  
Prerequisite: 554 or equivalent. Introductory development of finite element method as applied to various topics from continuum mechanics. Such areas as plane, axisymmetric and 3-D stress analysis; conduction, fluid mechanics; transient problems an geometric and material nonlinearity.
- 610 INTRODUCTION TO COMPOSITE MECHANICS** 3 credits  
Prerequisite: 554 or equivalent. Fundamental concepts of composites, composite micro-mechanics, macromechanics and laminate theory discussed from geometric relationships to laminate analysis for stiffness and strength. The geometric, mechanical, hygral and thermal behavior of composites described in terms of corresponding properties of the constituents. Emphasis placed on the physics of composite behavior; design and analysis of fiber composite laminates subjected to mechanical and environmental loading conditions.
- 611 FUNDAMENTALS OF SOIL BEHAVIOR** 2 credits  
Prerequisite: 314. In-depth examination of structure and fundamental physico-chemical and mechanical properties of engineering soils viewed as particulate matter.
- 612 ADVANCED SOIL MECHANICS** 3 credits  
Prerequisite: 314. Study of mechanics of behavior of soil as continuum. Principles of stress, strain, deformation, shear strength and pore water pressure as applied to mechanical behavior of soil masses.
- 613 ADVANCED GEOTECHNICAL TESTING** 3 credits  
Prerequisites: 518, 612. Theory and practice of static and dynamic in situ and laboratory soil testing. Testing procedures, applicability, limitations. General evaluation of geotechnical parameters for routine and special site conditions. One lecture, two laboratories per week.
- 614 FOUNDATION ENGINEERING I** 3 credits  
Prerequisite: 313 or permission. Foundation bearing capacity and settlement analysis. Design of shallow and deep foundation systems. Pile driving and load test procedures and analysis. Theory and design of earth-retaining structures including retaining walls, tiebacks and bulkheads.
- 615 FOUNDATION ENGINEERING II** 3 credits  
Prerequisite: 614 or permission. Soil-structure interaction theory and applications to under ground structures including conduits, tunnels and shafts. Advanced foundation construction methods and problems including dewatering, soil stabilization, underpinning and cofferdams. Slope stability analysis.
- 616 SOIL IMPROVEMENT** 3 credits  
Prerequisites: 313 and 314. Admixture stabilization, precompression with vertical drains, blasting, vibrocompaction, injection and grouting, thermal methods, electro-osmosis, soil reinforcement, case studies.
- 617 NUMERICAL METHODS IN GEOTECHNICAL ENGINEERING** 3 credits  
Prerequisites: 313 and 314. Steady-state and transient flow through soils, consolidation, soil-structure interaction, piling, stress-deformation analysis of earth structures.
- 618 ROCK MECHANICS** 3 credits  
Prerequisite: 554 or permission. Mechanical nature of rocks; linear elasticity and application to rock problems; inelastic behavior of rocks, time dependence and effects of pore pressure, experimental characterization of rock properties; failure theory and crack propagation.
- 620 SANITARY ENGINEERING PROBLEMS** 2 credits  
Prerequisite: 323. Application of both laboratory methods and theory to solution of sanitary engineering problems involving water pollution, stream regeneration, special industrial wastes, detergents and others.
- 621 ENVIRONMENTAL ENGINEERING PRINCIPLES** 4 credits  
Corequisite: 523. Provide the basic principles of chemical reaction engineering, microbiology, environmental regulations, and contaminant migration required for the understanding and solving environmental problems.
- 623 PHYSICAL/CHEMICAL TREATMENT PROCESSES** 3 credits  
Prerequisite or corequisite: 621. Theory, current research associated with physical/chemical processes; the impact on design-coagulation/flocculation, sedimentation, filtration, absorption processes emphasized.
- 624 BIOLOGICAL TREATMENT PROCESSES** 3 credits  
Prerequisite or corequisite: 621. Theory, current research associated with biological processes, related physical/chemical processes, the impact on design-activated sludge, fixed film processes, gas transfer, sludge stabilization, sludge dewatering processes emphasized.
- 625 WATER TREATMENT PLANT DESIGN** 3 credits  
Prerequisite: 623. Design of water treatment plants for potable, industrial and commercial uses. Development of water sources, treatment methods and financing used to design best practical methods in terms of cost-benefits.
- 626 WASTEWATER TREATMENT PLANT DESIGN** 3 credits  
Prerequisite: 624. Application of theory and fundamentals to design of wastewater treatment plants. System design methods used for biological and chemical stabilization of wastewater to meet water quality criteria. Economic analyses made to determine best practical designs to be utilized.
- 627 ENVIRONMENTAL OPERATIONS LABORATORY** 2 credits  
Prerequisite: 426 or permission of instructor. Conduction of laboratory experiments related to the design and operation of water and wastewater treatment processes. Experimental design, data collection, analysis and report preparation.
- 631 SOIL REMEDIATION** 3 credits  
Prerequisite: 621 or permission. Provide a thorough understanding of site characterization, traditional soil remediation technologies, as well as present new and emerging remediation technologies.
- 640 ADVANCED FLUID MECHANICS** 3 credits  
Prerequisite: 4500.310 or permission. Basic equations, Navier-Stokes equations. Analysis of potential flow, turbulence, hydraulic transients. Solution of typical fluid mechanics problems. Analysis of water hammer in pipe networks by method of characteristics.
- 644 OPEN CHANNEL HYDRAULICS** 3 credits  
Application of basic principles of fluid mechanics to flow in open channels. Criteria for analysis of uniform, gradually varied and rapidly varied flows. Study of movement and transportation of sediments. Design problems utilizing numerical techniques.
- 645 APPLIED HYDROLOGY** 3 credits  
Discussion of water cycle such as precipitation, evaporation, stream flows, floods, infiltration. Methods of analysis and their application to studies of water demand, storage, transportation including mathematical modeling of urban runoff and statistical hydrology.
- 646 COASTAL ENGINEERING** 3 credits  
Characteristics of linear and nonlinear wave theories. Interaction of structures, waves; design analysis of shore, offshore structures. Movement, transportation of sediments in lake shore areas.
- 681 ADVANCED ENGINEERING MATERIALS** 3 credits  
Selected topics on principles governing mechanical behavior of materials with respect to elastic, plastic and creep responses, stress rupture, low and high cycle and thermal fatigue. Failure theories and fracture phenomena in brittle and ductile materials. Crack propagation and life prediction of engineering materials.
- 682 ELASTICITY** 3 credits  
Prerequisite: 202. Plane stress, plane strain. Two-dimensional problems in rectangular, polar coordinates. Strain-energy methods. Stress, strain in three dimensions. Torsion. Bending. Thermal stresses.
- 683 PLASTICITY** 3 credits  
Prerequisite: 682, 4600.622 or equivalent. Mathematical formulation of constitutive equations with focus on their use in structural analysis. Internal variables. Isotropic, kinematic hardening. Nonisothermal plasticity. Finite deformations. Anisotropy.
- 684 ADVANCED REINFORCED CONCRETE DESIGN** 3 credits  
Prerequisite: 403. Slab systems. Equivalent frame properties. Limit analysis. Yield line theory. Lateral load systems. Shear walls. Footings. Biaxial column action.
- 685 ADVANCED STEEL DESIGN** 3 credits  
Prerequisite: 401. Properties of steel, fasteners, bearing, friction joints, Gusset plates, bolts in tension, end plates, weld joints, cyclic loads, fatigue analysis, types of detail, torsion, stability design.
- 686 EXPERIMENTAL METHODS IN STRUCTURAL MECHANICS** 3 credits  
Prerequisite: 682. Electrohydraulic closed-loop test systems. Methods for specimen heating. Strain measurement techniques for room and elevated temperatures. Design of computer controlled experiments investigating deformation and failure under complex stress states.
- 687 LIMIT ANALYSIS IN STRUCTURAL ENGINEERING** 3 credits  
Prerequisites: 454/554, 682. Fundamental theorems of limit analysis. The lower-bound and upper-bound solutions. Applications to frames, plates and plane stress and plane strain problems. Design considerations. Mathematical programming and computer implementation.
- 694 ADVANCED SEMINAR IN CIVIL ENGINEERING** 1-3 credits  
Prerequisite: permission. Advanced projects, reading, studies, or experimental in various areas of civil engineering.
- 697 ENGINEERING REPORT** 2 credits  
Prerequisite: Permission of advisor. A relevant problem in civil engineering for students electing the non-thesis option. The final engineering report must be approved by the advisor and the advisory committee.
- 698 MASTER'S RESEARCH** 1-6 credits  
Prerequisite: Permission of advisor. (May be repeated.) Research on a suitable topic in civil engineering culminating in a master's thesis.
- 699 MASTER'S THESIS** 1-6 credits  
Prerequisite: permission. Research and thesis on some suitable topic in civil engineering as approved by department. Defense of thesis is by final examination.

- 701 EARTHQUAKE ENGINEERING** *3 credits*  
Prerequisite: 604. Earthquake fundamentals. Earthquake response of single-story and multi-story buildings, as well as structural components. Modal analysis for earthquake response. Inelastic response of multistory structures. Earthquake codes. Stochastic approach.
- 702 PLATES AND SHELLS** *3 credits*  
Prerequisites: 682 and 3450-531. Navier and Levy solutions for rectangular plates. Approximate methods, including finite difference. Forces in middle plane. Large deflections. Differential geometry of a surface. Shells of revolution.
- 703 VISCOELASTICITY AND VISCOPLASTICITY** *3 credits*  
Prerequisite: 683. Formulation of constitutive relations for time dependent materials. Classical linear viscoelasticity. Internal variable representation of nonlinear, hereditary behavior. Creep and rate dependent plasticity. Continuum thermodynamics. Anisotropy.
- 704 FINITE ELEMENT ANALYSIS II** *3 credits*  
Prerequisite: 609 and 702 or permission. Curved, plate, shell brick elements. Quasi-analytical elements. Quadrature formulas. Substructuring for static and dynamic analyses. Solution algorithms for linear and nonlinear static and dynamic analysis. Computer program formulation. Review of large-scale production programs.
- 710 ADVANCED COMPOSITE MECHANICS** *3 credits*  
Prerequisite: 610. Analysis of short-fiber composites and statistical behavior, bending, buckling and vibration of laminated plates and shells. Advanced topics involving stress concentration, residue stress, fatigue, fracture toughness, nonlinear and viscoelastic stress-strain formulations, solutions of nonlinear problems.
- 712 DYNAMIC PLASTICITY** *3 credits*  
Prerequisite: 683 or 703. Impulsive and transient loading of structural elements (beams, plates, shells, etc.) in which inelastic deformation occurs. Topics include: longitudinal and transverse plastic wave propagation in thin rods, propagation of plastic hinges, rate-dependent viscoplastic waves, transverse impact on beams and plates, high-rate forming, blast loading, plate perforation, shock waves in solids.
- 717 SOIL DYNAMICS** *3 credits*  
Prerequisite: 614 or permission. Vibration and wave propagation theory relating to soils, soil structures and foundations. Dynamic behavior of soils. Design of foundations for dynamic loading impact, pulsating and blast loads.
- 731 BIOREMEDIATION** *3 credits*  
Prerequisite: 621 or permission. Provide the fundamentals required for understanding and successfully implementing the biodegradation of hazardous compounds coupled with the design and operational techniques of bioremediation systems.
- 745 SEEPAGE** *2 credits*  
Discussion of parameters determining permeability of various soils. Analytical, numerical and experimental methods to determine two- or three-dimensional movement of groundwater. Unsteady flows.
- 898 PRELIMINARY RESEARCH** *1-15 credits*  
(May be repeated for a total of 15 credits.) Prerequisite: approval of dissertation director. Preliminary investigations prior to the submission of a dissertation proposal to the interdisciplinary Doctoral Committee.
- 899 DOCTORAL DISSERTATION** *1-15 credits*  
(May be taken more than once.) Prerequisite: acceptance of research proposal by the interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student.
- 631 CIRCUIT ANALYSIS** *3 credits*  
Prerequisite: graduate standing. Operational methods, time domain analysis, state variable methods and matrix techniques applied in circuit analysis. Realizability and synthesis of driving point impedance and transfer functions.
- 641 RANDOM SIGNAL ANALYSIS** *3 credits*  
Prerequisite: 447. Analysis, interpretation and smoothing of engineering data through application of statistical and probability methods.
- 643 INFORMATION THEORY AND CODING** *3 credits*  
Prerequisite: 641 or permission. Sources, channels, entropy, mutual information, source coding theorem and channel coding theorem. Channel coding theorem for waveform channels. Introduction to rate-distortion theory.
- 644 CHANNEL CODING** *3 credits*  
Prerequisite: 641 or permission. Algebraic structure of error-control codes; techniques for encoding and decoding. Coverage of the major classes of linear block codes and convolutional codes.
- 646 DIGITAL SIGNAL PROCESSING** *3 credits*  
Prerequisite: 333. Relations between continuous and discrete-time Fourier expansions. Sampling, aliasing, sampling rate conversion. Operator concepts in signal processing, all-pass systems, FFT digital filter design.
- 647 DIGITAL SPECTRAL ANALYSIS AND SIGNAL MODELING** *3 credits*  
Prerequisites: 646 or permission of instructor. Methods and theory of spectral analysis and signal modeling are investigated in detail. Applications of theory include speech processing, optimal filtering, biomedical systems, digital communications.
- 648 DETECTION AND ESTIMATION THEORY** *3 credits*  
Prerequisite: 641 or permission. Signal detection, estimation of signal parameters in noise: Bayes, minimax, Neyman-Pearson criteria; nonparametric and robust procedures; Wiener and Kalman filtering.
- 649 STATISTICAL COMMUNICATION THEORY** *3 credits*  
Prerequisite: 641 or permission. Fundamental principles of transmission of digital information over noisy channels. Optimum receivers. Bandwidth and dimension. Capacity of the bandlimited white gaussian noise channel.
- 650 ELECTROMAGNETIC THEORY I** *3 credits*  
Prerequisite: permission of instructor. Electrostatics: uniqueness theorem, boundary-value problems, constructions of Green's functions. Magnetostatics. Electrodynamics: energy and momentum, EM potentials, Stratton-Chu formulation, radiation, dyadic Green's functions.
- 651 ELECTROMAGNETIC THEORY II** *3 credits*  
Prerequisite: 650 or permission of the course instructor. Scattering, TEM waves; guided wave theory: transmission lines, closed-boundary guides and cavities, modal orthogonality and completeness, Green's function, excitation and coupling, open-boundary waveguides.
- 652 ADVANCED ELECTROMAGNETICS** *3 credits*  
Prerequisite: 651. Application of Maxwell's equations. Propagation equations and antenna analysis.
- 655 ADVANCED ANTENNA THEORY AND DESIGN** *3 credits*  
Prerequisite: 453/553 or equivalent. Basic properties and recent advances of microstrip antennas. Analysis and design of reflector antennas. Analysis and synthesis of linear and planar antenna arrays.
- 661 DESIGN OF DIGITAL SYSTEMS** *3 credits*  
Prerequisite: 465. Applications of logic circuits in modern digital electronic computer and in digital communication systems. Computer organization and control, input-output devices and interface standards, advanced topics in computers.
- 662 TOPICS IN ELECTRONICS** *3 credits*  
Prerequisite: permission of department head. Discussions of recent advances in electronics.
- 663 VLSI CIRCUITS AND SYSTEMS** *3 credits*  
Prerequisite: graduate status. An introductory course designed to provide a broad understanding of very-large-scale-integrated (VLSI) systems, circuits, and devices. Topics include design, simulation, layout, fabrication, and test procedures.
- 664 INTEGRATED CIRCUIT DEVICES** *3 credits*  
Prerequisite: 353, 360, or equivalent. Develops physical and analytical descriptions of solid-state electronic devices leading to equations and models of (Schottky and PN) diodes and (field-effect and bipolar) transistors.
- 671 DISCRETE CONTROL SYSTEMS** *3 credits*  
Prerequisite: 472/572 or permission. Theory, techniques for analysis, design of discrete control systems. Z-transform technique, stability analysis, frequency response. Optimization Digital computer control.
- 673 NONLINEAR CONTROL** *3 credits*  
Corequisite: 674 or instructor permission. Designed to provide students with qualitative insights into nonlinear systems as well as techniques for controlling such systems. Topics include describing functions, Popov and circle criteria, jump resonances, subharmonics, phase plane, conservative systems, Lyapunov theory, bifurcation of attractors, and routes to chaos.
- 674 CONTROL SYSTEM THEORY** *3 credits*  
Prerequisite: 371 or instructor permission. Advance modern control theory for linear systems. Controllability, observability, minimal realizations of multivariate systems, stability, state variable feedback, estimation, and an introduction to optimal control.
- 675 SYSTEM SIMULATION** *3 credits*  
Prerequisite: 472 or permission of the instructor. This course is designed to provide the control engineer with tools necessary to simulate continuous systems on a digital computer. Topics include linear multistep methods, nonlinear methods, stiff systems, optimization, parallel computing and simulation languages.
- 676 RANDOM PROCESS ANALYSIS** *3 credits*  
Prerequisite: 674. Analysis and design of control systems with stochastically defined input. Introduction to estimation filters.
- 677 OPTIMAL CONTROL I** *3 credits*  
Prerequisite: 674. Formulation of optimizational problem; application of variational calculus, maximum principle and optimality principle to control problems. Computational techniques in optimization.
- 680 DYNAMICS AND CONTROL OF POWER ELECTRONIC CIRCUITS** *3 credits*  
Prerequisites: 483/583 or equivalent. Averaged and sampled-data models for rectifiers and DC/DC converters. Small- and large-signal models about the cyclic steady-state. Feedback controls using classical and modern approaches.
- 681 POWER SYSTEM ANALYSIS** *3 credits*  
Prerequisite: 480. Short circuit and load flow analysis of power systems with emphasis on computer solution. Transient machine analysis.
- 682 POWER SYSTEM STABILITY** *3 credits*  
Prerequisite: 681. Steady state and transient stability of power systems with emphasis on computer solution.

## ELECTRICAL ENGINEERING

### 4400:

- 521 ENGINEERING ECONOMY** *2-3 credits*  
Prerequisites: 3250-244 and senior standing in engineering. Presents engineering economics as distinguished from classical economic theory.
- 549 DIGITAL COMMUNICATION** *3 credits*  
Prerequisite: 445. Introduction to digital communication theory and systems; coding of analog and digital information; digital modulation techniques. Introduction to information theory.
- 553 ANTENNA THEORY** *3 credits*  
Prerequisite: 354 or equivalent. Theory of EM radiation. Wire antennas, arrays, receiving antennas, reciprocity. Integral equations for induced currents, self and mutual impedances. Equivalent principle, radiation from aperture antennas.
- 555 MICROWAVES** *4 credits*  
Prerequisite: 354 or equivalent. Dynamic fields, Maxwell's equation and wave equations. Field analysis of wave guides, microwave components, techniques and systems.
- 565 PROGRAMMABLE LOGIC** *4 credits*  
Prerequisite: 363. Electronic circuitry considerations in logic circuits, methods of sequential, threshold logic analysis, synthesis, development of computer arithmetic elements; memory, storage devices.
- 572 CONTROL SYSTEMS II** *3 credits*  
Prerequisite: 371. Digital design with programmable devices. PLD and FPGA architectures. Logic design and technology mapping tools.
- 580 SYMMETRICAL COMPONENTS** *3 credits*  
Prerequisite: 381. Per unit method as applied to power system calculations. Fundamental principles of symmetrical components as applied to analysis of electrical circuits and machines.
- 583 POWER ELECTRONICS I** *3 credits*  
Prerequisite: 381. Elements of power electronics circuits. Rectifiers, converters, inverters analysis and design.
- 584 POWER ELECTRONICS LABORATORY AND DESIGN PROJECT** *2 credits*  
Prerequisite: 483/583 or equivalent. Experiments on different types of power electronic converters: AC/DC, DC/DC, DC/AD, and AC/AC. Design project to include design, simulation, building, and testing of a power electronic circuit.
- 585 ELECTRIC MOTOR DRIVES** *3 credits*  
Prerequisite: 381. Application of electric machines, choice of motor for particular drive. Application of power semiconductor circuits in electric machinery.
- 598 TOPICS IN ELECTRICAL ENGINEERING** *1-2 credits*  
(May be taken more than once.) Prerequisite: permission of department head. Special topics in electrical engineering.
- 600 ADVANCED MICROCOMPUTER SYSTEMS** *3 credits*  
Prerequisite: 365 or permission. Discussion of multiprocessing, numerical data processors, multitasking, system bus architectures, 16-bit and 32-bit microprocessor architectures, multi-level protection and virtual memory, as supported by commercial microprocessor.

- 683 ECONOMICS OF POWER SYSTEMS** 3 credits  
Prerequisite: 681 Analysis and operation of power system for economic dispatching using a computer.
- 684 PROTECTIVE RELAYING** 3 credits  
Prerequisite: 480. Principles and application of relays as applied to protection of power systems.
- 685 SURGE PROTECTION** 3 credits  
Prerequisite: 480. Phenomena of lightning and switching surges on electrical systems. Protection of systems and apparatus by line design, application of protective devices and insulation coordination.
- 686 DYNAMICS OF ELECTRIC MACHINES** 3 credits  
Prerequisites: graduate status in Electrical Engineering. Voltage and mechanical differential equations of electric machines, analytical and numerical methods for solution of a system of machine differential equations.
- 687 POWER ELECTRONICS II** 3 credits  
Prerequisite: 483/583 or equivalent. Effects of the nonidealities of the power circuit components, magnetics, base and gate drives, thyristor commutation circuits, heat transfer and thermal issues. Analysis and design of advanced power circuits.
- 688 CONTROL OF ELECTRIC MACHINES** 3 credits  
Prerequisites: graduate student in Electrical Engineering. Elements of control circuits for electric drives, techniques for torque/speed control of electric machines.
- 689 POWER SEMICONDUCTOR DEVICES** 3 credits  
Prerequisite: graduate status in Electrical Engineering. Structure and physics of power semiconductor devices: diodes, Bipolar junction transistors, MOSFETs, Thyristors, Power MOS-Bipolar devices (IGT/MCT). Emphasis on the issues that characterize these devices from the lower power semiconductor devices.
- 693 SPECIAL PROBLEMS** 1-3 credits  
(May be taken more than once) Prerequisite: permission of department head. For a qualified graduate student. Supervised research or investigation in major field of training or experience. Credits dependent upon nature and extent of project.
- 698 MASTER'S RESEARCH** 1-6 credits  
Prerequisite: Permission of advisor. (May be repeated.) Research on a suitable topic in electrical engineering culminating in a master's thesis.
- 699 MASTER'S THESIS** 1-6 credits  
Prerequisite: permission of department head. Research and thesis on some suitable topic in electrical engineering.
- 749 FUNCTIONAL ANALYTIC METHODS IN SYSTEM THEORY** 3 credits  
Prerequisite: permission of instructor. A course providing necessary background in advanced mathematical techniques for graduate students in communication, control, and mathematics.
- 753 TOPICS IN ELECTROMAGNETICS** 3 credits  
Prerequisite: 651 Introduction to advanced techniques in fields. Topics include application of Green's function techniques and related boundary value problems.
- 772 MODEL REDUCTION TECHNIQUES FOR CONTROL SYSTEMS** 3 credits  
Prerequisite: 674 or permission of the instructor. Classical, modern, and optimal techniques for computing reduced order models of linear, nonlinear, and infinite dimensional systems. Minimal realizations of multi-variable systems are also considered.
- 774 ADVANCED LINEAR CONTROL SYSTEMS** 3 credits  
Prerequisite: 674 and a course in Real Analysis or equivalent. Covers topics related to the design of robust control systems. The synthesis of controllers which yield stable closed-loop systems will be considered. The H<sub>∞</sub>-optimality criterion for controller design is included. Special emphasis will be given to the robust stabilization problem and the disturbance attenuation problem.
- 775 ROBUST CONTROL** 3 credits  
Prerequisite: 674. Input-output and state-space characterizations of robust control systems, and design techniques based on the algebraic Riccati equation. Decentralized and reliable control design methodologies.
- 777 OPTIMAL CONTROL II** 3 credits  
Prerequisite: 677 Advanced state-feedback optimal control. Output-feedback issues, including loop transfer recovery, optimal observer design, reduced-order controllers, frequency weighting, and decentralized control.
- 778 ADAPTIVE CONTROL** 3 credits  
Prerequisite: 674 or permission of instructor. This course will provide the advanced graduate student with the techniques required for the control of time-varying nonlinear and stochastic systems. Topics include minimum prediction error control, least squares estimation, certainty equivalence adaptive control. Kalman filtering, minimum variance control, LQG control and stochastic adaptive control.
- 779 ADVANCED TOPICS IN CONTROL** 3 credits  
Prerequisite: 776. Discussions of recent advances in control systems.
- 794 ADVANCED SEMINAR** 1-3 credits  
(May be taken more than once) Prerequisite: permission of department head. Advanced level coverage of specialized topics. For student seeking Ph.D. in engineering.
- 898 PRELIMINARY RESEARCH** 1-15 credits  
(May be repeated.) Prerequisite: approval of dissertation director. Preliminary investigations prior to submission of a dissertation proposal to the Interdisciplinary Doctoral Committee.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
(May be repeated.) Prerequisite: acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student.

## COMPUTER ENGINEERING

### 4450:

- 520 OBJECT ORIENTED DESIGN** 3 credits  
Prerequisites: 3460:208 or equivalent. Investigation of object-oriented design paradigm and the design implementation with the object-oriented programming language C++.
- 570 INTEGRATED SYSTEM DESIGN** 3 credits  
Prerequisite for 470: 4400:465. Introduction to computer structures, design methods and development tools for VLSI systems. nMOS devices and fabrication. Processing and control design. Layout methods and tools. Design systems.
- 597 SPECIAL TOPICS: COMPUTER SCIENCE** 1-2 credits  
(May be taken more than once) Prerequisite: permission of department head. Special topics in computer engineering.

- 606 COMPUTER ARCHITECTURE** 3 credits  
Prerequisite: 4400:363 or equivalent. Historical development of computer architecture. Design methodologies. Processor organization and design of instruction sets. Parallel processing. Control section implementations. Memory organization. System configurations.
- 607 PARALLEL COMPUTER ARCHITECTURE** 3 credits  
Prerequisite: 606 or equivalent. This course provides an introduction to parallel computer architectures and parallel processing based on a single instruction, message-passing, or shared memory.
- 610 COMPUTER ALGORITHMS I** 3 credits  
Prerequisites: 4100:206 and 3450:235. Organization of scientific and engineering problems for computer solutions. Analysis of error and convergence properties of algorithms.
- 611 COMPUTER ALGORITHMS II** 3 credits  
Prerequisite: 610 or permission. Data structures and algorithm design for minimum execution time and memory requirements.
- 620 FAULT-TOLERANT COMPUTING** 3 credits  
Prerequisite: 363 or equivalent. This course encompasses the many aspects of fault-tolerant computing and covers reliability, fault-models, fault-tolerant design techniques, quantitative evaluation methods, testing, and design for testability.
- 642 ADVANCED KNOWLEDGE ENGINEERING** 3 credits  
Prerequisite: 641 or equivalent. Advanced study of knowledge acquisition and expert system project management.
- 643 FRAME-BASED EXPERT SYSTEM DESIGN** 3 credits  
Prerequisites: 441, 641, or equivalent. Introduction to the design and development of frame-based expert systems.
- 693 SPECIAL PROBLEMS** 1-3 credits  
(May be taken more than once) Prerequisite: permission of department head. For a qualified graduate student. Supervised research or investigation in student's major field. Credit depends upon nature and extent of project.
- 794 ADVANCED SEMINAR** 1-3 credits  
(May be taken more than once) Prerequisite: permission of department head. Advanced level coverage of various topics. Intended for student seeking Ph.D. in engineering.

## MECHANICAL ENGINEERING

### 4600:

- 500 THERMAL SYSTEM COMPONENTS** 3 credits  
Prerequisites: 301, 310, 315. Performance analysis and design of basic components of thermal energy exchange and conversion systems. Components studied include heat exchangers, pumps, compressors, turbines and expansion engines.
- 510 HEATING AND AIR CONDITIONING** 3 credits  
Prerequisites: 301, 315. Thermodynamics of gas mixtures. Design and selection of air conditioning equipment. Control of gas mixtures, heating, cooling and humidity.
- 511 COMPRESSIBLE FLUID MECHANICS** 3 credits  
Prerequisites: 301, 310. Subsonic and supersonic flow in nozzles; diffusers and ducts. One-dimensional reactive gas dynamics. Prandtl-Meyer theory. Applications to design and analysis of compressors, turbines, and propulsion devices.
- 512 FUNDAMENTALS OF FLIGHT** 3 credits  
Prerequisite: 310 or equivalent or permission of instructor. Introduction to basic aerodynamics, airplane performance, stability and control, astronautics and propulsion. Design considerations are emphasized.
- 513 INTRODUCTION TO AERODYNAMICS** 3 credits  
Prerequisites: 300 and 310 or permission. Introduction of aerodynamic concepts; conformal transformations, theory of thin airfoils, 2-dimensional airfoil theory, wings of finite span, lifting line theories, lumped-vortex, vortex-lattice, and panel methods.
- 514 INTRODUCTION TO AEROSPACE PROPULSION** 3 credits  
Prerequisites: 300 and 310 or permission. Introduction to propulsion systems currently used in the aerospace field; propulsion principles for turbojets, turbofans, ramjets, chemical rockets, and electrical rocket propulsion.
- 515 ENERGY CONVERSION** 3 credits  
Prerequisites: 310, 315. Topics from fields of internal combustion engines, cycle analysis, modern conversion devices.
- 516 ENERGY TRANSFER PROCESSES** 3 credits  
Prerequisite: 315. Analysis, design of extended surfaces. Natural convective, combined modes of heat transfer and heat transfer with a change of phase. Heat transfer in magnetohydrodynamic systems.
- 522 EXPERIMENTAL STRESS ANALYSIS I** 3 credits  
Prerequisite: 336 or 4300:202. Experimental methods of determining stress or strain: brittle lacquer, strain gages, photoelasticity.
- 530 MACHINE DYNAMICS** 3 credits  
Prerequisite: 321. Static and dynamic forces in machines, products of inertia, dynamic equivalence, flywheels. Balancing of rotating, reciprocating, cyclic plane motion. Computer simulation of transient mechanism dynamics, other topics in advanced dynamics.
- 531 FUNDAMENTALS OF MECHANICAL VIBRATIONS** 3 credits  
Prerequisites: 203 and 3450:235. Undamped and forced vibrations of systems having one or two degrees of freedom.
- 532 VEHICLE DYNAMICS** 3 credits  
Application of dynamic systems analysis techniques to road vehicles. Newtonian and Lagrangian methods. Tire/road, interface. Ride characteristics, handling and stability. Digital simulation.
- 540 SYSTEM DYNAMICS AND CONTROL** 4 credits  
Prerequisites: 315, 431, or permission. Laplace transforms. Mathematical models of physical systems. Transient response and stability. Error analysis and system accuracy. Root locus methods in design. Frequency analysis and design. Compensation techniques.
- 541 CONTROL SYSTEMS DESIGN** 3 credits  
Prerequisites: 315, 431, 340. Methods of feedback control design such as minimized error, root-locus, frequency domain. Compensation techniques. Multivariable and nonlinear design methods and computer-aided control design.

- 542 INDUSTRIAL AUTOMATIC CONTROL** 3 credits  
Prerequisite: 440 or equivalent. Operation of basic control mechanisms. Study of mechanical, hydraulic, pneumatic, fluidic control systems, including application areas. Tuning of control devices for optimum performance of system. Case studies on control applications from industry, e.g. boilers, furnaces, process heaters.
- 543 OPTIMIZATION METHODS IN MECHANICAL ENGINEERING** 3 credits  
Prerequisite: 360. Development and method of solution of optimization problems in mechanical engineering. The use of dynamic programming and operational research methods for optimization including computer utilization and applications.
- 544 ROBOT DESIGN, CONTROL AND APPLICATION** 3 credits  
Prerequisites: 321, 440 or equivalent. Robot design and control. Kinematic transformations, velocities and accelerations, path trajectories and dynamics, control and sensing in robotics. The automated factory with robot applications.
- 550 INTRODUCTION TO COMPUTATIONAL FLUID FLOW AND CONVECTION** 3 credits  
Prerequisites: 315, 360, or permission of instructor. Numerical modeling of fluid/thermal systems; numerical solution of the momentum and thermal boundary layer equations; flow simulation using advanced heat transfer/fluid/graphics packages.
- 562 PRESSURE VESSEL DESIGN** 3 credits  
Prerequisite: 336 or 4300.202. Introduction to modern pressure vessel technology. Topics include basic structural considerations, materials and their environment and design-construction features.
- 563 COMPUTER AIDED DESIGN AND MANUFACTURING** 3 credits  
Prerequisite: 460 or permission. The use of computer systems to assist in the creation, modification, analysis, or optimization of engineering designs, and to plan, manage, and control manufacturing plants.
- 600 GAS DYNAMICS** 3 credits  
Prerequisite: 411/511. Derivation of equations for multi-dimensional irrotational flow of a compressible fluid. Method of small perturbations. Method of characteristics. Ideal flow theory. Transonic flow. One dimensional unsteady flow.
- 608 THERMODYNAMICS** 3 credits  
Prerequisite: 301 or equivalent. Extension and generalization of basic laws of thermodynamics with application to a variety of physical and biological systems. Introduction to irreversible thermodynamics, the third law and statistical thermodynamics.
- 609 FINITE ELEMENT ANALYSIS I** 3 credits  
Prerequisite: 622. Introductory development of finite element method as applied to various topics from continuum mechanics. Areas covered include plane; axisymmetric and 3-D stress analysis; conduction; fluid mechanics; transient problems and geometric and material nonlinearity.
- 610 DYNAMICS OF VISCOUS FLOW I** 3 credits  
Prerequisites: 301, 310 or equivalent. Derivation and solution of equations governing laminar viscous flow. Applications include unsteady flows, slow viscous flows, parallel flows, lubrication theory and laminar boundary layers.
- 611 COMPUTATIONAL FLUID MECHANICS** 3 credits  
Prerequisite: 610 or permission of instructor. Study of numerical methods in fluids; numerical errors and stability; finite differencing, nonlinear convection terms, Poisson equations, boundary conditions, turbulence, spectral and finite element techniques.
- 615 CONDUCTION HEAT TRANSFER** 3 credits  
Prerequisite: 315 or equivalent. Study of one-, two- and three-dimensional heat conduction. Development of analytical techniques for analysis and design.
- 616 CONVECTION HEAT TRANSFER** 3 credits  
Prerequisite: 315 or equivalent. Heat transfer from laminar, turbulent external, internal flows. Convective heat transfer at high velocities. Heat transfer to liquid metals; high Prandtl number fluids.
- 617 RADIATION HEAT TRANSFER** 3 credits  
Prerequisite: 315 or equivalent. Study of governing radiation laws. Black and real systems, geometric factors, gray enclosures, non-gray systems, gaseous radiation, radiation equipment.
- 618 BOILING HEAT TRANSFER AND TWO-PHASE FLOW** 3 credits  
Prerequisites: 301, 315 or equivalent. Current techniques to determine heat transfer and pressure drop in components such as boilers, heat exchangers, and steam generators, with boiling. Boiling mechanism, slip ratio, critical heat flux and instabilities in boiling flow systems.
- 620 EXPERIMENTAL STRESS ANALYSIS II** 2 credits  
Prerequisite: 422/522. Dynamic strain gage methods, transducer design, Moire fringe techniques and topics in photoelasticity.
- 621 INTRODUCTION TO TIRE MECHANICS** 3 credits  
Prerequisite: permission. Topics include tire as vehicle component, tire traction and wear, laminated structures, tire stress and strains and advanced tire models.
- 622 CONTINUUM MECHANICS** 3 credits  
Prerequisite: 336 or permission. Analysis of stress and deformation at a point. Derivation of fundamental field equations of fluid and solid mechanics by applying basic laws of dynamics, conservation of mass and energy. Development of constitutive laws.
- 623 APPLIED STRESS ANALYSIS I** 3 credits  
Prerequisite: 622. Continuation of 622 with specific application to solid mechanics. Development of energy theorems due to Reissner, Washizu and generalized Hamilton's principle. Solutions to static and dynamic problems.
- 624 FUNDAMENTAL OF FRACTURE MECHANICS** 3 credits  
Prerequisite: 622 or permission of instructor. Methods of stress analysis in elastic media containing holes and cracks. Theories of brittle fracture. Dynamic crack propagation. Fatigue fractures. Finite element approaches to fracture mechanics.
- 625 ANALYSIS OF MECHANICAL COMPONENTS** 3 credits  
Prerequisite: 337 or equivalent. Theories of failure and plastic flow. Fatigue, creep analysis and introduction to fracture mechanics.
- 626 FATIGUE OF ENGINEERING MATERIALS** 3 credits  
Prerequisite: 624 or permission. Quasi-static and cyclic behavior; dislocation networks and their interactions; correlation of dislocation-microstructure interactions; crack initiation; crack propagation, short cracks; crack closure; environmental effects.
- 627 ADVANCED MATERIALS AND MANUFACTURING PROCESSES** 3 credits  
Prerequisite: 380. Manufacturing processes for advanced materials; classification; technological aspects of bulk deformation, casting, joining, forming, machining, molding, powder metallurgy, rapid solidification, economic aspects; technical activity.
- 628 MECHANICAL BEHAVIOR OF MATERIALS** 3 credits  
Prerequisite: 380 or permission. Mechanical behavior of engineering materials; metallurgy of deformation; dislocation effects and deformation; strengthening mechanisms; thermomechanical processing; mechanical testing.
- 629 NONLINEAR ENGINEERING PROBLEMS** 3 credits  
Prerequisite: 622. Study of nonlinear ordinary and partial differential equations governing phenomena of mechanics. Analysis of phase-space trajectories, singularities and stability. Development of approximate analytical methods.
- 630 VIBRATIONS OF DISCRETE SYSTEMS** 3 credits  
Prerequisite: 431/531 or equivalent. Study of vibrations of multidegree of freedom systems including free and forced vibrations, damped and transient response, normal mode vibrations and matrix iteration techniques. application to seismic design and shock design.
- 631 KINEMATIC DESIGN** 3 credits  
Prerequisites: 321 and permission of instructor. The geometry of constrained motion. Analysis of relative plane motion using vectors and the digital computer. Curvature theory. Synthesis of linkages and gearing. Introduction to computer-aided design.
- 632 RELIABILITY IN DESIGN** 3 credits  
Prerequisites: 430/530 or equivalent and 3470.461/561. The reliability determination of mechanical components and systems and its use in design. Distribution, reliability determination, normal and log-normal theories, Weibull theory, life spectrum analysis, renewal theory and confidence limits.
- 633 COMPUTERIZED MODAL ANALYSIS OF STRUCTURES** 3 credits  
Prerequisite: 630 or equivalent. Modal analysis theory and measurement techniques, digital signal processing concepts, structural dynamics theory, modal parameter estimation with "hands-on" experience in the application of modal measurement methods in vibration analysis.
- 634 ADVANCED DYNAMICS OF ROTATING MACHINERY** 3 credits  
Prerequisites: 430/530 or equivalent. Dynamic modelling and simulation of complex rotor-bearing systems. Steady state, transient and stability analysis with inertia, gyroscopic, imbalance, rotor-bow, disk-skew and impeller-rub interaction effects.
- 635 STRESS WAVES IN SOLIDS AND FLUIDS** 3 credits  
Prerequisite: 337 or equivalent. The wave equation. Propagation of elastic-plastic stress waves through solid media. Transmission, reflection, absorption and diffraction phenomena. Low and high velocity impact. Dynamic fracture. Numerical simulation techniques.
- 642 SYSTEM ANALYSIS AND CONTROL DESIGN** 3 credits  
Prerequisite: 440 or equivalent. Uniform methods of modeling and response analysis, controllability and observability, stability theory and analysis of linear and nonlinear engineering processes. Design of feedback controls for optimum performance for multivariable real-time control application.
- 643 DISTRIBUTED PROCESS CONTROL DESIGN AND APPLICATIONS** 3 credits  
Prerequisite: 440 or equivalent. Digital and continuous control algorithms. Process control function implementation. Self-learning, diagnostics, intelligent control systems. Case studies and experiments from various engineering disciplines.
- 645 PROCESS IDENTIFICATION AND COMPUTER CONTROL** 3 credits  
Prerequisite: 440 or equivalent or by permission. Obtaining mathematical models of processing from noisy observations. Methods of digital control design. Case studies on computer control of selected processes.
- 646 EXPERT SYSTEMS IN CONTROLS AND MANUFACTURING** 3 credits  
Prerequisite: 440/540 or equivalent or by permission. Expert system methodologies for process control, computer integrated flexible manufacturing and robotics.
- 647 NEURAL AND FUZZY CONTROL SYSTEMS** 3 credits  
Prerequisite: 440/540 or permission of instructor. Analysis and design of intelligent control systems. Neural networks and fuzzy sets for process identification and controller design. Applications and case studies in industry.
- 650 TRIBOLOGY** 3 credits  
Fundamentals of friction lubrication and wear treated; includes basic theory, advanced topics, applications to bearings, seals, gears, cams. Specific topics include adhesive and abrasive friction/wear, boundary lubrication, fluid film lubrication and bearings, rolling element bearings, bearing dynamics.
- 660 ENGINEERING ANALYSIS** 3 credits  
Prerequisite: B.S. in engineering. Study of analysis techniques as applied to specific engineering problems. Applications include beam deflections, acoustics, heat conduction and hydrodynamic stability.
- 665 CORD MECHANICS** 3 credits  
Prerequisite: 622. Elastic and viscoelastic theory of wire rope is derived from thin rod theory. Applications are discussed with respect to tire mechanics, bioengineering and lamina composite constructions.
- 693 MEASUREMENTS METHODS AND EXPERIMENTAL ERROR IN THERMOFLUID SCIENCES** 3 credits  
Prerequisites: viscous flow, conduction heat transfer convection heat transfer. The course will incorporate elements of experimental error analysis, optics, and optical ray tracing, principles of testing, methods and devices for fluid flow quantization and temperature measurements. Laboratory work with hands-on experience.
- 696 SPECIAL TOPICS IN MECHANICAL ENGINEERING** 1-4 credits  
Prerequisite: Permission. For qualified candidate for graduate degree. Supervised research in the student's major field of training or experience. Credit depends upon nature and extent of project as determined by adviser and department head.
- 697 ENGINEERING REPORT** 2 credits  
Prerequisite: Permission of advisor. A relevant problem in mechanical engineering for students electing the non-thesis option. The final engineering report must be approved by the advisor and the advisory committee.
- 698 MASTER'S RESEARCH** 1-6 credits  
Prerequisite: Permission of advisor (May be repeated.) Research on a suitable topic in mechanical engineering culminating in a master's thesis.
- 699 MASTER'S THESIS** 1-4 credits  
Prerequisite: permission of advisor. Supervised research in a specific area of mechanical engineering.
- 704 FINITE ELEMENT ANALYSIS II** 3 credits  
Prerequisites: 609, 4300.702. Curved, plate, shell, brick elements; quasi-analytical elements. Quadrature formulas. Substructuring for static and dynamic analysis. Solution algorithms for linear and nonlinear static and dynamic analysis. Computer program formulation. Review of large-scale production programs.
- 705 FINITE ELEMENT ANALYSIS III** 3 credits  
Prerequisite: 704. Static and dynamic contact problems. Tire mechanics. Fracture mechanics. Plasticity problems involving small and large deflections. Shake down analysis. General constitutive models for composite media, thermoviscoelasticity, fluid turbulence. Fluid-solid interaction analysis.
- 710 DYNAMICS OF VISCOUS FLOW II** 3 credits  
Prerequisite: 610. Introduction to turbulence. Turbulence modeling and turbulent boundary layers. Practical methods of solution of boundary layer problems. Transition process.

- 711 COMPUTATIONAL FLUID DYNAMICS II** 3 credits  
Prerequisite: 611 or permission of instructor. Development of advanced computational techniques for convection-dominated flows. Higher order explicit and implicit schemes including nonoscillatory front-capturing methods applied to benchmark problems.
- 715 HYDRODYNAMIC STABILITY** 3 credits  
Prerequisites: 660, 620 or permission. Stability concepts, Stability of Benard convection, Rayleigh-Taylor flow, parallel shear layers, boundary layers, asymptotic solution of Orr-Sommerfeld equation, nonparallel stability.
- 719 ADVANCED HEAT TRANSFER** 3 credits  
Prerequisites: 615, 616. Topics include nonhomogeneous or nonlinear boundary value problems of heat conduction, heat transfer with melting, solidification and ablation, heat transfer in porous systems and hydrodynamically and thermally unsteady convection.
- 723 APPLIED STRESS ANALYSIS II** 3 credits  
Prerequisite: 623. Continuation of 623. Development of approximate solution techniques including finite elements, method of weighted residuals (Rayleigh-Ritz, Galerkin, Trefftz, collocation, least squares, etc.) and finite differences.
- 726 NONLINEAR CONTINUUM MECHANICS** 3 credits  
Prerequisite: 622. Finite deformation and strain, stress, constitutive equations, strain energy functions. Solution of finite deformation problems in hypelasticity, coupled thermoviscoelasticity and plasticity, electroelasticity and micropolar theories.
- 730 VIBRATIONS OF CONTINUOUS SYSTEMS** 3 credits  
Prerequisite: 630. Continuation of 630. Analysis of continuous vibrating systems, using separation of variables, energy, variational, Rayleigh-Ritz and other approximate techniques. Concepts and solutions of integral equations as applied to continuous systems.
- 731 RANDOM VIBRATIONS** 3 credits  
Prerequisite: 630 or equivalent. Stationary random processes and their transmission through linear time-invariant discrete and continuous vibrating systems. Analysis of random data and interaction between mechanisms of failure.
- 732 ADVANCED MODAL ANALYSIS OF STRUCTURES** 3 credits  
Prerequisite: 633 or equivalent. Structural excitation techniques. Modal parameter estimation. System modification; mass/stiffness/damping matrices substructuring. Prediction and evaluation of structural modified dynamic characteristic.
- 741 OPTIMIZATION THEORY AND APPLICATIONS** 3 credits  
Prerequisite: permission. Theory of optimization in engineering systems, development and method of solution optimization problems for physical processes, large systems. Use of dynamic programming, operational research methods of system optimization, control.
- 763 ADVANCED METHODS IN ENGINEERING ANALYSIS** 3 credits  
Prerequisite: 3450:235 or equivalent. Applications of finite difference and finite element methods, variational methods, integral methods and similarity transforms to engineering problems in heat transfers, fluid mechanics and vibrations.
- 790 ADVANCED SEMINAR IN MECHANICAL ENGINEERING** 1-4 credits  
(May be repeated for a total of nine credits) Prerequisite: permission of department head. Advanced projects and studies in various areas of mechanical engineering. Intended for student seeking Ph.D in engineering degree.
- 898 PRELIMINARY RESEARCH** 1-15 credits  
Prerequisite: approval of dissertation director. Preliminary investigations prior to the submission of a dissertation proposal to the Interdisciplinary Doctoral Committee.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
(May be taken more than once.) Prerequisite: acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval by the dissertation director. Original research by the doctoral student.
- 635 PHYSIOLOGICAL CONTROL SYSTEMS** 3 credits  
Prerequisite: 4400:371 or equivalent, or by permission. Analyses of motor, circulator, homeostatic, and other physiological functions are carried out from the perspective of control theory, both linear and nonlinear. Both similarities to and differences from traditional engineering systems will be presented. Computer simulations of several physiological systems will be developed.
- 638 IMAGE PROCESSING FOR BIOMEDICAL DATA** 3 credits  
Image sampling, quantization, and transforms. Enhancements including smoothing and sharpening. Restoration using inverse and Wiener filters. Edge detection and thresholding with region growing for segmentation.
- 640 SPINE MECHANICS** 3 credits  
Prerequisites: 3100:561 or equivalent; 4300:406 or equivalent; or permission. Physical properties and functional biomechanics of the spine. Kinematics and kinetics of the human spine. Biomechanics of scoliosis, trauma, instability, pain, and orthoses. Mechanics and design of surgical implants.
- 641 SOFT CONNECTIVE TISSUE BIOMECHANICS** 3 credits  
Prerequisites: 3100:561 or equivalent; 4300:407 or equivalent; or permission. Physical properties and functional biomechanics of ligament, tendon, joint-capsule insertions, myotendinous junction, articular cartilage and meniscus. The mechanics of injury, repair, and replacement for accelerated repair and improved function.
- 642 HARD CONNECTIVE TISSUE BIOMECHANICS** 3 credits  
Prerequisites: 3100:561 or equivalent; 4300:407 or equivalent; or permission. Physical properties and functional biomechanics of bone. The biology and mechanics of fracture and fracture healing. Mechanics of external and internal fixators. Total joint implants and reconstruction techniques.
- 644 MUSCLE MECHANICS AND OPTIMIZATION** 3 credits  
Prerequisite: Graduate standing in the College of Engineering or by permission. Human body joint kinetics, muscle mechanics and modelling. The principles of optimization as applied to muscle forces, along with muscle anatomy and physiology.
- 645 MECHANICS IN PHYSIOLOGY AND MEDICINE** 3 credits  
Prerequisites: 4600:310 and 4300:202 or equivalent. Blood rheology, mechanics of microcirculation, finite deformation theory, soft tissue mechanics, mechanics of blood and lymph circulation, kinetics and kinematics of orthopedic joints. Clinical applications.
- 647 KINEMATICS OF THE HUMAN BODY** 3 credits  
Prerequisites: 4600:321 or equivalent, graduate standing in the College of Engineering or by permission. Analytical methods used to model and quantify human body motion. Three-dimensional kinematics, joint coordinate systems, functional anatomy, segment center of mass and joint centers.
- 650 CARDIOVASCULAR DYNAMICS** 3 credits  
Prerequisites: 3100:561, 562, or equivalent; 4600:310 or equivalent. Analysis of blood pumping action, pressure/flow waveform transmission and blood rheology factors. Use of modeling and direct measurement techniques. Clinical implications of disease.
- 651 CARDIOVASCULAR DIAGNOSTIC AND THERAPEUTIC TECHNIQUES** 3 credits  
Prerequisites: 3100:561, 562 or equivalent. Cardiovascular disease conditions, instrumentation and techniques for diagnosis and surgical procedures, and services for treatment. Direct interaction with active clinical laboratories.
- 652 EXPERIMENTAL METHODS IN BIOMECHANICS** 3 credits  
Prerequisite: graduate standing in the College of Engineering or permission. Principles of testing and measuring devices commonly used for biofluid and biosolid mechanics studies. Laboratories for demonstration and hands-on experience.
- 653 TRANSPORT PHENOMENA IN BIOLOGY AND MEDICINE** 3 credits  
Prerequisites: 4200:321, 322 or 4600:310, 315 or equivalent. Basic definitions, cardiovascular mass and momentum transport, compartment modeling, mass transfer in physiological systems and artificial kidney and lung devices. Design optimization. Analysis of human thermal system.
- 655 REHABILITATION ENGINEERING** 3 credits  
Prerequisites: graduate standing in engineering, mathematics, or science; or permission of the instructor. Devices for rehabilitation, interfacing the motor and/or sensory impaired, quantitative assessment techniques, prosthetics and orthotics, bedsores mechanics, emerging technologies.
- 660 BIOMATERIALS AND LABORATORY** 4 credits  
Corequisite: Biomaterials Laboratory. Material uses in biological applications. Effect of physiological environment and sterilization on materials. Controlled and uncontrolled degradation. Effect of materials on soft tissue, hard tissue and blood. Laboratory experiments using materials designed for biomedical use and demonstrations of biological/materials interactions.
- 663 ARTIFICIAL ORGANS** 3 credits  
Prerequisites: graduate standing in the College of Engineering or permission of instructor. Study of the rationale for the engineering and clinical aspects required for the design and variety of artificial organs, with emphasis on the artificial heart and artificial kidney.
- 670 MATHEMATICAL MODELING IN BIOLOGY AND MEDICINE** 3 credits  
Prerequisites: graduate standing in engineering, mathematics, or physics; or permission of instructor. Modeling of pharmacokinetic, cardiovascular, neuromuscular, and immune systems, and artificial organ interactions. Deterministic and stochastic approaches.
- 685 MEDICAL DEVICES AND ARTIFICIAL ORGANS** 3 credits  
Prerequisites: graduate standing in engineering, mathematics, or science, or permission of instructor. Design of medical devices and artificial organs, requirements, safety considerations, tissue constraints, optimization techniques, government regulations, and legal liability.
- 697 SPECIAL TOPICS** 1-4 credits  
(May be repeated) Prerequisite: permission of instructor. Current topics or supervised study in the area of biomedical engineering. Credit hours depend upon the nature and extent of the course or the project.
- 698 MASTER'S RESEARCH** 1-6 credits  
Prerequisite: Permission of advisor. (May be repeated.) Research on a suitable topic in biomedical engineering culminating in a master's thesis.
- 699 MASTER'S THESIS** 1-6 credits  
Prerequisite: permission of adviser. Supervised research in the specific area of biomedical engineering.
- 898 PRELIMINARY RESEARCH** 1-15 credits  
(May be repeated) Prerequisite: Approval of the dissertation director. Preliminary investigations prior to the submission of a dissertation proposal to the Interdisciplinary Doctoral Committee.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
Prerequisite: acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student.

## BIOMEDICAL ENGINEERING 4800:

- 601 BIOMEDICAL INSTRUMENTATION I** 4 credits  
Prerequisites: 3100:561, 562, and 4400:232 or 4400:320. Clinical instrumentation to measure and display physiologic and anatomic parameters. Basic concepts of instrumentation including design criteria and operational analysis. Practical experience gained through the use of instrumented mammalian models.
- 611 BIOMETRY** 3 credits  
Statistics and experimental design topics for the biomedical and biomedical engineering disciplines including: distributions, hypothesis testing and estimation, ANOVA, probit analysis and nonparametric statistics.
- 620 NEURAL NETWORKS** 3 credits  
Examination of highly parallel, distributed architectures for computing that are, to varying degrees, derived from structures observed in biological nervous systems. After an overview of how real neurons operate, the course will examine both classical and modern neural computing architectures. Comparisons will be made with traditional serial machines and applications for which neural networks seem most promising will be examined.
- 621 SENSORY SYSTEMS ANALYSIS** 3 credits  
Prerequisite: 4400:371 or equivalent, or by permission. Study of various sensory modalities from a systems engineering perspective. Techniques from linear and nonlinear systems analysis are applied to aspects of vision, hearing, touch, and position sensing in humans. Comparisons are made with artificial emulations of these senses.
- 630 BIOMEDICAL COMPUTING** 3 credits  
Prerequisite: 4100:206 or equivalent. Computer applications in health care, clinical laboratories, AMHT, medical records, direct order entry, A-D, D-A conversion, patient monitoring, peripherals and interfaces, diagnostic algorithms, automated EEG, ECG systems.
- 632 PROCESSING OF BIOMEDICAL SIGNALS** 3 credits  
Prerequisites: graduate standing in the College of Engineering and 611 or equivalent. Concepts for the analysis of biological continuous signals and point processes including discriminant and principal component analysis, histograms, correlograms and data displays.
- 634 MEDICAL IMAGING DEVICES** 3 credits  
Imaging modalities including radiation, magnetic resonance, and sound. The formation of images. Specific devices including computer tomography, magnetic resonance, ultrasound, gamma cameras and PET.

# College of Education

## EDUCATIONAL FOUNDATIONS AND LEADERSHIP

### 5100:

- 512 DESIGN AND PRODUCTION OF INSTRUCTIONAL MATERIALS** *3 credits (20 clinical hours)*  
Design, adaptation and preparation of instructional materials using graphics, transparency production, video equipment, computer authoring software, mounting and laminating processes, photography and other procedures.
- 514 ORGANIZING AND SUPERVISING EDUCATIONAL MEDIA PROGRAMS** *3 credits*  
Prerequisite: 310 or permission of the instructor. Procedures for planning, organizing and evaluation educational media programs including media facilities and services.
- 520 INTRODUCTION TO INSTRUCTIONAL COMPUTING** *3 credits*  
Examines the use of word processing, spread sheets, databases, graphics, telecommunications and authoring software in both educational and business settings and evaluates instructional and applications software.
- 590,1,2 WORKSHOP** *1-3 credits*  
Individual work under staff guidance on curriculum problems, utilization of community resources, planning of curriculum units.
- 594 EDUCATIONAL INSTITUTES** *1-4 credits*  
Special course designed as in-service upgrading programs.
- 600 PHILOSOPHIES OF EDUCATION** *3 credits*  
Examination of basic philosophical problems underlying broad educational questions that confront society. Provides foundation for understanding of questions of modern society and education.
- 602 COMPARATIVE AND INTERNATIONAL EDUCATION** *3 credits*  
Comparative study of selected national school systems with reference to forces that shape their characteristics. Different theoretical approaches used in study of comparative education also investigated.
- 604 TOPICAL SEMINAR IN THE CULTURAL FOUNDATIONS OF EDUCATION** *3 credits*  
(May be repeated for a total of six credits) Issues and subjects related to study of educational institutions, theories and/or ideas. Different topics will be offered from section to section.
- 614 PLANNING FOR TECHNOLOGY** *3 credits*  
Prerequisite: 520 or permission of instructor. Emphasizes the process of planning for the use of technology in the school. Includes plans for faculty support and alternative arrangements of computer set ups.
- 616 ADULT EDUCATION** *2 credits*  
Survey course for teachers and administrators. Historical background including influences and their relation to developments in the field. Emphasis on background and social value of current programs.
- 620 PSYCHOLOGY OF INSTRUCTION FOR TEACHING AND LEARNING** *3 credits*  
Prerequisite: 210/211 or equivalent. Current theories and research in the areas of cognition and learning, development, and motivation that underly approaches to teaching in any context.
- 624 SEMINAR: EDUCATIONAL PSYCHOLOGY** *3 credits*  
(May be repeated for a total of six credits. Prerequisite: 250 or equivalent. In-depth study of research in selected areas of learning, development, evaluation and motivation.
- 630 TOPICAL SEMINAR IN COMPUTER-BASED EDUCATION** *3 credits*  
(May be repeated for a total of six credits. Prerequisite: 420/520. Advanced topics related to development, implementation, research and evaluation in C.B.E. Student involvement emphasized, required. Knowledge of programming language recommended.
- 636 TOPICAL SEMINAR IN EDUCATIONAL TECHNOLOGY** *3 credits*  
(Repeatable for up to nine credits.) Current trends and practices in educational technology: computer authoring software, tools and processes for instructional video production, presentation systems.
- 640 TECHNIQUES OF RESEARCH** *3 credits*  
Research methods and techniques commonly used in education and behavioral sciences; preparation of research reports. Includes library, historical, survey and experimental research and data analysis.
- 642 TOPICAL SEMINAR IN MEASUREMENT AND EVALUATION** *3 credits*  
(May be repeated for a total of six credits) Topics of current interest and need will be emphasized. The student will develop extended competence with contemporary measurement and evaluation techniques.
- 646 MULTICULTURAL COUNSELING** *3 credits*  
Prerequisites: 5600/643 or permission of instructor. An examination of multicultural counseling theory and research necessary to work with culturally diverse people.
- 648 INDIVIDUAL AND FAMILY DEVELOPMENT ACROSS THE LIFESPAN** *3 credits*  
An exploration of individual and family development. Emphasis will be placed on understanding the relationship between the individual and his/her family.
- 695 FIELD EXPERIENCE: MASTER'S** *1-3 credits*  
Prerequisites: permission of department head and instructor. Area determined in accordance with student's program and professional goals.
- 696 MASTER'S TECHNOLOGY PROJECT** *2-3 credits*  
Prerequisite: permission of advisor. Prepare and test a technology learning package that includes any combination of text, graphics, sound, color, motion, and the provision for interaction by the target students.
- 697 INDEPENDENT STUDY** *1-3 credits*  
(May be repeated for a total of six credits) Prerequisites: permission of department head and instructor. Specific area of study determined in accordance with student's program and professional goals.
- 698 MASTER'S PROBLEM** *2-4 credits*  
Prerequisite: permission of advisor. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with problems in educational foundations.
- 699 MASTER'S THESIS** *4-6 credits*  
Prerequisites: permission of department head and instructor. In-depth study of research problem within humanistic and behavior foundation.

- 701 HISTORY OF EDUCATION IN AMERICAN SOCIETY** *3 credits*  
Historical development of education in American social order, with special emphasis on social, political and economic setting.
- 703 SEMINAR: HISTORY AND PHILOSOPHY OF HIGHER EDUCATION** *3 credits*  
Prerequisite: 600 or equivalent. History and philosophy related to genesis and development of higher education in the Western world, with special emphasis given to higher education's development in United States.
- 705 SEMINAR: SOCIAL-PHILOSOPHICAL FOUNDATIONS OF EDUCATION** *3 credits*  
(May be repeated for a total of six credits) Prerequisite: 600 or equivalent. Inquiry into selected ideological, social, economic and philosophical factors affecting educational development in United States and other countries.
- 721 LEARNING PROCESSES** *3 credits*  
Study of principles underlying classroom learning processes with particular emphasis on teaching as means of modifying pupil behavior; cognitive, motor, social and affective.
- 723 TEACHER BEHAVIOR AND INSTRUCTION** *3 credits*  
Prerequisite: 600. Intensive survey of theoretical and empirical literature involving teacher and conceptions of instruction. A student reports on theory, empirical research and applications in areas of individual interests.
- 741 STATISTICS IN EDUCATION** *3 credits*  
Statistical methods and techniques used in educational measurement and in educational research. Emphasis on hypothesis testing.
- 743 ADVANCED EDUCATIONAL STATISTICS** *3 credits*  
Prerequisite: 741. A second course on quantification in behavioral sciences. Includes testing of statistical hypotheses, experimental design, analysis of variance and nonvariance, factor analysis and introduction to nonparametric statistics.
- 798 RESEARCH PROJECT IN SPECIAL AREAS** *1-3 credits*  
Prerequisites: permission of department head and instructor. Critical and in-depth study of specific problem in educational foundations.
- 801 RESEARCH SEMINAR** *3 credits*  
(May be repeated for a total of six credits) Prerequisites: 640 and 741; permission of department head and instructor. Intensive study of research methods applicable to education. Emphasis on developing a dissertation proposal.
- 897 INDEPENDENT STUDY** *1-4 credits*  
(May be repeated for a total of eight credits) Prerequisites: permission of department head and instructor. Specific area of inquiry within humanistic and behavioral foundations of education determined in advance by student and faculty adviser.

## HIGHER EDUCATION ADMINISTRATION

### 5190:

- 500 INTRODUCTION TO THE STUDY OF HIGHER EDUCATION** *3 credits*  
Introductory examination of roles, functions, issues, trends, topics and activities in institutions of higher education.
- 515 ADMINISTRATION IN HIGHER EDUCATION** *3 credits*  
In-depth study of administrative roles, functions, knowledge and skills requirements, and administrative behavior. Trends in administrative theory and application also explored.
- 521 LAW AND HIGHER EDUCATION** *3 credits*  
Legal aspects of higher education, sources of law and authority presented, impact on, interaction with, and implications of the administration of higher education discussed.
- 525 TOPICAL SEMINAR: HIGHER EDUCATION** *3 credits*  
(May be repeated.) Topical study in a variety of areas related to public and/or private higher education institutions, organizations. Maximum of six credits applied to degree.
- 526 STUDENT SERVICES AND HIGHER EDUCATION** *3 credits*  
Examination of issues related to the delivery and evaluation of student services in higher education.
- 527 THE AMERICAN COLLEGE STUDENT** *3 credits*  
Introduction to the sociopsychological literature concerning the impact of college on students and student development theory.
- 530 HIGHER EDUCATION CURRICULUM AND PROGRAM PLANNING** *3 credits*  
Study of curriculum planning at the college and university level, factors influencing curriculum design, theories and practices of curricular change and innovation are also explored.
- 590 WORKSHOP** *3-6 credits*  
(May be repeated for a total of six credits.) Emphasizing the development and demonstration of leader behavior appropriate to the college or university setting.
- 600 ADVANCED ADMINISTRATIVE COLLOQUIUM IN HIGHER EDUCATION** *1 credit*  
(May be repeated; Prerequisite: permission. Examination of selected perspectives and topics which pose concerns to participation students.
- 601 INTERNSHIP IN HIGHER EDUCATION** *1-3 credits*  
(May be repeated for a total of six credits) Prerequisite: permission; corequisite: 602. Intensive work experience in operations of an institution of higher education, related to student's own program of studies and professional goals.
- 602 INTERNSHIP IN HIGHER EDUCATION SEMINAR** *1 credit*  
(May be repeated for a total of three credits) Prerequisite: permission; corequisite: 601. To be taken in conjunction with internship for synthesis of problems encountered in internship experience and to provide the opportunity to share ideas and experiences from various areas of higher education internship placement.
- 620 FINANCE AND HIGHER EDUCATION** *3 credits*  
Facilitates student's understanding of how American Higher Education is financed, identifies various methodologies used, and political and economic impacts and processes involved.
- 626 ORGANIZATION AND POLICY DEVELOPMENT IN HIGHER EDUCATION** *3 credits*  
Familiarizes student with the policymaking process as it related to higher education. Theoretical approaches explored, internal and external policy actors identified, and implementation issues examined.
- 635 INSTRUCTIONAL STRATEGIES AND TECHNIQUES FOR THE COLLEGE INSTRUCTOR** *3 credits*  
Selected topics in instructional theory, techniques and strategies which are appropriate to instructional planning and development of college-level courses.
- 645 INDEPENDENT STUDY IN HIGHER EDUCATION** *1-3 credits*  
Selected areas of independent investigation in an area of higher education as determined by the advisor and student in relation to student's academic needs and career goals.

# ELEMENTARY EDUCATION

## 5200:

- 511 CREATIVE TECHNIQUES FOR EXPLORING CHILDREN'S LITERATURE** 2 credits  
Prerequisite: 286. Examination of techniques for interpretation of children's literature including storytelling, creative dramatics, reader's theatre and choral speaking.
- 515 MICROCOMPUTER APPLICATIONS FOR ELEMENTARY TEACHERS** 3 credits  
Prerequisite: 5100:520 or permission of instructor. Focus is upon developing student competence in the use of elementary education computer technology to enhance both the teacher's personal and professional productivity.
- 535 ACTIVITIES TO INDIVIDUALIZE SOCIAL STUDIES** 2 credits  
Prerequisite: 338. Development of materials and activities (learning games, simulation games, simulations, learning stations, programmed field trips and map activities) to provide teacher with variety of techniques in order to develop an individualized, student-involved social studies program.
- 536 GEOMETRY AND MEASUREMENT IN ELEMENTARY SCHOOL MATHEMATICS** 3 credits  
Prerequisite: 336. Trends in geometry and measurement instruction in elementary school. Procedures for development of important geometric concepts and measurement skills.
- 537 STRUCTURE OF THE NUMBER SYSTEM IN ELEMENTARY SCHOOL MATHEMATICS** 3 credits  
Prerequisite: 336. Applied and advanced topics in mathematics education in elementary school. Thorough investigation of number system presently being taught in elementary school.
- 538 MATERIALS AND LABORATORY TECHNIQUES IN ELEMENTARY SCHOOL MATHEMATICS** 3 credits  
Prerequisite: 336. Applied mathematics. Construction and application of mathematical models. Procedures for development of important mathematical concepts through the laboratory approach.
- 539 PROPERTIES OF NUMBERS IN ELEMENTARY SCHOOL MATHEMATICS** 3 credits  
Prerequisite: 336. Investigation of those number properties that help explain how laws of arithmetic work. Procedures for development of important arithmetic concepts and computational skills.
- 540 CONTEMPORARY ELEMENTARY SCHOOL SCIENCE PROGRAMS** 2 credits  
Prerequisite: 333. Contemporary elementary science programs critically analyzed and their procedure developed and implemented in University classroom.
- 590,1,2,3, WORKSHOP** 1-3 credits each  
Elective workshop for elementary education major who would pursue further refinement of teaching skills. Emphasizes demonstrations of teaching techniques and development of suitable teaching devices.
- 594 EDUCATIONAL INSTITUTES** 1-4 credits  
Special courses designed as in-service upgrading programs. Frequently provided with the support of national foundations.
- 620 LITERATURE FOR YOUNG CHILDREN** 2 credits  
Literature for children ages two through six examined in depth in terms of value and purpose; methods and techniques for presenting it to children; variety and quality of books available.
- 630 ELEMENTARY SCHOOL CURRICULUM AND INSTRUCTION** 2 credits  
Application of findings of recent research to curriculum building and procedures in teaching.
- 631 TRENDS IN ELEMENTARY EDUCATION** 2 credits  
Prerequisites: graduate standing and 630. Investigation of innovative programs, organizational patterns and new curricula currently operational in elementary schools including analysis of use of these innovations in relation to teaching/learning process.
- 640 THEORY AND PRACTICE IN ELEMENTARY SCHOOL MATHEMATICS** 2 credits  
Comparative analysis and evaluation of purposes and procedures of mathematics programs for elementary schools with application of findings to instructional methods and materials.
- 641 DIAGNOSIS AND TREATMENT OF PERFORMANCE DIFFICULTIES IN ELEMENTARY SCHOOL MATHEMATICS** 2 credits  
Examination of implications of contemporary mathematics learning theory on diagnostic-remedial process.
- 645 PROBLEMS IN ELEMENTARY SCIENCE EDUCATION** 2 credits  
Examination of influence of new curricular designs in elementary science. Emphasis on inquiry, investigation and discovery and their impact on total elementary school curriculum.
- 650 EDUCATION AND THE YOUNG CHILD** 2 credits  
Content centered on educational settings of young children from birth through five years.
- 666 INDIVIDUALIZED INSTRUCTION: LEARNING STYLE IDENTIFICATION AND RESOURCE PRESCRIPTION** 3 credits  
Prerequisites: permission of instructor and 630. Individual learning style characteristics, practical approaches in individualization of instruction, multisensory resource development and prescription.
- 695.6 FIELD EXPERIENCE: MASTER'S** 1-2 credits each  
Prerequisites: permission of adviser and department head. On-the-job experience related to student's course of study.
- 697 INDEPENDENT STUDY** 1-3 credits  
Prerequisites: permission of adviser and department head. Selected areas of independent investigation as determined by adviser and related to student's academic needs.
- 698 MASTER'S PROBLEM** 2-4 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in elementary education.
- 699 MASTER'S THESIS** 4-6 credits  
Prerequisites: 5100:640 and permission of adviser and department head. In-depth research investigation. Student must be able to demonstrate necessary competencies to deal with research problems in elementary education.
- 732 SUPERVISION OF INSTRUCTION IN THE ELEMENTARY SCHOOL** 2 credits  
Supervisory role of elementary principal and other supervisory personnel.
- 780 SEMINAR IN ELEMENTARY EDUCATION** 1-3 credits  
(May be repeated) Intensive examination of following areas of elementary school instruction: children's literature, curriculum development, language arts, mathematics, reading, science, social studies, early childhood, critical analysis of children's literature, art, human sexuality, computers and middle school.
- 781 RESIDENCY SEMINAR** 2 credits  
Two-hour weekly meeting for elementary doctoral student in residence.
- 799 RESEARCH PROJECTS IN ELEMENTARY EDUCATION** 1-2 credits  
Prerequisites: permission of adviser and department head. In-depth investigation of specific problem pertinent to elementary education.

- 880 SEMINAR IN CURRICULAR AND INSTRUCTIONAL STUDIES** 1-3 credits  
(May be repeated for a total of nine credits) An intensive examination of a particular area of teacher education.
- 895,6,7 FIELD EXPERIENCE FOR ELEMENTARY DOCTORAL STUDENT** 1-2 credits each  
Prerequisites: permission of adviser and department head. Designed to help student preparing to teach methods course at college level.
- 898 INDEPENDENT STUDY** 1-3 credits  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and department head. Selected areas of independent investigation as determined by adviser and related to student's academic needs.
- 899 DOCTORAL DISSERTATION** 1-20 credits  
Prerequisites: permission of adviser and department head. Study and in-depth analysis of a research problem in elementary education.

## READING

### 5250:

- 511 MATERIALS AND ORGANIZATIONS FOR READING INSTRUCTION** 3 credits  
Prerequisite: 5200:339. Professional problems of selection and evaluation of reading materials and classroom organizations explored.
- 540 DEVELOPMENTAL READING IN THE CONTENT AREAS - ELEMENTARY** 3 credits  
Prerequisite: 5200:337 or permission of instructor. Nature of reading skills relating to content subjects. Methods and materials needed to promote reading achievement in content subjects by the elementary classroom teacher.
- 541 LANGUAGE AND ITS RELATIONSHIP TO READING IN THE ELEMENTARY SCHOOL** 3 credits  
Prerequisite: 5200:337 or permission of the instructor. An overview of the linguistic field in the teaching of reading in the elementary school. A discussion of major linguistic principles for classroom application in grades K-6.
- 542 TEACHING READING TO CULTURALLY DIVERSE LEARNERS** 3 credits  
Prerequisite: 5200:337 or by permission of the instructor. Knowledge, skills and attitudes to employ effective methods of teaching reading to diverse populations and/or learners whose language patterns are nonstandard.
- 680 TRENDS IN READING INSTRUCTION** 2 credits  
Prerequisite: 5200:335 or 5300:425. Survey course designed to update reading background of student who has not had a recent course in reading.
- 681 DIAGNOSIS AND CORRECTION OF READING PROBLEMS** 5 credits  
Prerequisite: 680. Relation of growth to reading development and reasons for retardation. Implementation of diagnostic and corrective techniques by developing case studies in supervised setting.
- 682 CLINICAL PRACTICES IN READING** 5 credits  
Prerequisite: 681. Nature and etiology of reading difficulties experienced by selected children. Supervised practices and independent work with children in conjunction with staff from other disciplines.
- 683 READING DIAGNOSIS FOR SCHOOL PSYCHOLOGISTS AND SUPPORT PERSONNEL** 3 credits  
Prerequisite: 5200:630 or permission of instructor. This course will survey developmental reading and its relationship to reading difficulties. Formal and informal procedures for diagnosing disabled readers and a discussion of prescriptive strategies will be included.
- 692 ADVANCED STUDY AND RESEARCH IN READING INSTRUCTION** 3 credits  
Survey of research comparison and evaluation of programs, design and development of projects in reading through group/individual study.
- 693 SUPERVISION AND CURRICULUM DEVELOPMENT IN READING INSTRUCTION** 2 credits  
Relative to total curriculum; procedures for developing reading program in all curriculum areas; examination of children's literature and related instructional reading by supervisors and consultants.

## SECONDARY EDUCATION

### 5300:

- 530 INSTRUCTIONAL AND MANAGEMENT PRACTICES** 3 credits  
Prerequisite: 780. Students will learn to use both teaching models and management strategies to achieve effectiveness in instructions. Also included are educational issues that relate to effective management and instruction.
- 535 CONCEPTS AND CURRICULUM DESIGNS IN ECONOMIC EDUCATION** 3 credits  
Economic education concepts appropriate from grade levels K-12 and adult education courses. Economic education materials developed to teach the concepts utilized.
- 545 COMPUTER APPLICATIONS FOR SECONDARY TEACHERS** 3 credits  
Prerequisite: 5100:520 or permission of instructor. Develops student competence in the use of secondary education computer technology to enhance both the teacher's personal and professional productivity.
- 575 VOCATIONAL BUSINESS EDUCATION** 3 credits  
Prerequisite: senior status or permission. Principles of program construction, organization, implementation, evaluation, improvement, and development of program guides for both intensive and cooperative vocational business education.
- 590,1,2,3 WORKSHOP** 1-3 credits each  
Individual work under staff guidance on curriculum problems, utilization of community resources, planning of curriculum units.
- 594 EDUCATIONAL INSTITUTES** 1-6 credits  
Special courses designed as in-service upgrading programs, frequently provided with the support of national foundations.
- 619 SECONDARY SCHOOL CURRICULUM AND INSTRUCTION** 2 credits  
Application of findings of recent research to curriculum building and procedures in teaching.
- 625 READING PROGRAMS IN SECONDARY SCHOOLS** 3 credits  
For all subject teachers both with and without previous study in the teaching of reading. Materials, class organization and procedures for developing reading improvement programs, for all secondary school and college students.
- 630 ADVANCED INSTRUCTIONAL TECHNIQUES IN BOOKKEEPING - ACCOUNTING AND BASIC BUSINESS SUBJECTS** 3 credits  
Intensive examination of teaching-learning strategies for improvement of instruction. Emphasis on teacher coordination of methods, preplanned objectives and evaluation to insure maximum student competency in subject knowledge and skill.

- 632 ADVANCED INSTRUCTIONAL TECHNIQUES IN TYPEWRITING AND TYPEWRITING-RELATED SUBJECTS** *3 credits*  
Intensive examination of teaching-learning strategies of improvement of instruction. Emphasis on teacher coordination of methods preplanned objectives and evaluation to ensure maximum student competency in subject knowledge and skill.
- 695 FIELD EXPERIENCE: MASTER'S** *1-6 credits*  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and supervisor of field experience. On-the-job experience related to student's program of studies.
- 697 INDEPENDENT STUDY** *1-3 credits*  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and supervisor of independent study. Area of study determined by student's needs.
- 698 MASTER'S PROBLEM** *2-4 credits*  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in secondary education.
- 699 MASTER'S THESIS** *4-6 credits*  
Prerequisite: permission of adviser. In-depth study of research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in secondary education.
- 721 SUPERVISION OF INSTRUCTION IN THE SECONDARY SCHOOL** *2 credits*  
Definition of supervisory leadership role in improving instruction at secondary school level and development of practical theory of secondary school supervision.
- 780 SEMINAR IN SECONDARY EDUCATION** *1-3 credits*  
(May be repeated) Intensive examination of a particular area of secondary education.
- 781 RESIDENCY SEMINAR** *1 credit*  
(Must be repeated) One hour weekly meeting for secondary education doctoral student in residence.
- 782 RESIDENCY SEMINAR** *1 credit*  
(Must be repeated) One-hour weekly meeting for secondary education doctoral student in residence.
- 880 SEMINAR IN CURRICULAR AND INSTRUCTIONAL STUDIES** *1-3 credits*  
(May be repeated for a total of nine credits) An intensive examination of a particular area of teacher education.
- 895 FIELD EXPERIENCE: DOCTORAL** *1-6 credits*  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and director of field experience. Intensive job-related experience pertinent to student's needs. Student must be able to demonstrate skills and leadership abilities in an on-the-job situation.
- 897 INDEPENDENT STUDY** *1-6 credits*  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and director of independent study. Area of study determined by student's needs.
- 898 RESEARCH PROJECT IN SPECIAL AREAS** *1-2 credits*  
Prerequisite: permission of adviser. Critical and in-depth study of specific problem in secondary education.
- 899 DOCTORAL DISSERTATION** *1-20 credits*  
Prerequisite: permission of adviser. Specific research problem that requires student to apply research skills and techniques pertinent to problem being studied.

## TECHNICAL AND VOCATIONAL EDUCATION

### 5400:

- 500 THE POSTSECONDARY LEARNER** *3 credits*  
Describes characteristics of the postsecondary learner; studies issues, factors, and strategies pertinent to successful facilitation of learning in a variety of postsecondary learning environments.
- 505 OCCUPATIONAL EDUCATION FOR YOUTH AND ADULTS** *3 credits*  
History and operation of current occupational education for youth and adults. Includes study of social, economic and political influences that stimulate growth and expansion of occupational education.
- 515 TRAINING IN BUSINESS AND INDUSTRY** *3 credits*  
Examines the role and mission of the training function in the modern industrial setting. Provides a foundation for a student planning to become an industrial trainer or training supervisor of technicians and other occupational skill-development levels.
- 530 SYSTEMATIC CURRICULUM DESIGN FOR TECHNICAL INSTRUCTION** *3 credits*  
Procedure of breaking down an occupation to determine curriculum for laboratory and classroom, developing this content into an organized sequence of instructional units.
- 535 INSTRUCTIONAL TECHNIQUES IN TECHNICAL EDUCATION** *3 credits*  
Prerequisite: 530 and 5100/520 or equivalent. Selected topics in instructional techniques appropriate to postsecondary technical education. Emphasis on instructional methods, techniques in classroom, laboratory including tests, measurements.
- 541 EDUCATIONAL GERONTOLOGY SEMINAR** *3 credits*  
Designed for person practicing in field of gerontology or preparing for a specialization in educational gerontology, including person responsible for development and implementation of courses, seminars, occupational training programs and workshops for older people.
- 551 HOME ECONOMICS JOB TRAINING** *3 credits*  
Prerequisite: senior standing or permission of instructor. Concept development in vocational home economics. Job training, program development, operational procedures, skill and knowledge identification, training profiles, job description and analysis. Individualized study guides. In-school and on-the-job observation.
- 590,1,2 WORKSHOP** *1-3 credits each*  
Individual work under staff guidance on curriculum problems, utilization of community resources, planning of curriculum units.
- 594 EDUCATIONAL INSTITUTES** *1-4 credits*  
Special courses designed as in-service upgrading programs, frequently provided with the support of national foundations.
- 600 THE TWO-YEAR COLLEGE** *3 credits*  
An in-depth analysis of the history, purpose and philosophy of the two-year college, types of institutions offering two-year programs, management, issues and trends.
- 605 ADVANCED SYSTEMATIC CURRICULUM DESIGN FOR TECHNICAL INSTRUCTION** *3 credits*  
Prerequisite: 430/530. An examination of the instructional design process for technical instruction and a review of research in effective performance-based technical program planning and evaluation.

- 610 COMMUNICATION WITH BUSINESS AND INDUSTRY** *2 credits*  
Techniques of establishing better communications between education and business and industry. Emphasis on the advisory committee, coordination functions and working with local professional associations in the community.
- 615 ADVANCED TECHNICAL INSTRUCTIONAL DEVELOPMENT** *3 credits*  
Prerequisite: 435/535. An in-depth analysis of assessment of technical instruction and research on methods of technical instruction.
- 620 SUPERVISION OF TECHNICAL INSTRUCTION** *3 credits*  
Prerequisites: 430/530 and 435/535. An examination of the role of supervisor of technical instruction, facilitation and evaluation of technical instructors, professional development, as well as related leadership and management issues.
- 661 CURRENT ISSUES IN HIGHER EDUCATION** *2 credits*  
(May be repeated with change in topic) Examination of many current problems and issues in institutions of higher education, adult education, technical institutes, community colleges, proprietary schools, undergraduate, graduate and professional education.
- 690 INTERNSHIP: TEACHING VOCATIONAL EDUCATION** *3 credits*  
Prerequisites: completion of all required Technical Education coursework. Technical instruction or curriculum development under supervision from the University and the learning organization. Includes a seminar and portfolio development.
- 695 FIELD EXPERIENCE: MASTER'S** *1-6 credits (30-180 field hours)*  
Prerequisites: permission of adviser and supervisor of field experience. On-the-job experience related to student's program of studies. Credit/Non-credit.
- 697 INDEPENDENT STUDY** *1-3 credits*  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and supervisor of independent study. Area of study determined by student's need.
- 698 MASTER'S PROBLEM** *2-4 credits*  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in technical and vocational education.
- 699 MASTER'S THESIS** *4-6 credits*  
Prerequisite: permission of adviser. In-depth study of research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in vocational education.

## PHYSICAL EDUCATION

### 5550:

- 536 FOUNDATIONS AND ELEMENTS OF ADAPTED PHYSICAL EDUCATION** *3 credits*  
Principles, components, and strategies necessary in providing motor activities for handicapped students via application of a neuro-developmental model and alternative methods. Three hour lecture.
- 541 ADVANCED ATHLETIC INJURY MANAGEMENT** *4 credits (30 clinical hours)*  
Prerequisites: 3100/208/209, 5550/240. Advanced athletic training techniques for the student desiring to become a certified athletic trainer according to the regulations of the National Athletic Trainers Association.
- 542 THERAPEUTIC MODALITIES AND EQUIPMENT IN SPORTS MEDICINE** *3 credits (30 clinical hours)*  
Prerequisites: 3100/208/209, 5550/240. Purpose is to develop techniques and skills among sports medicine personnel in the selection and implementation of therapeutic modalities and the equipment used in the rehabilitation of injuries to athletes.
- 551 ASSESSMENT AND EVALUATION IN ADAPTED PHYSICAL EDUCATION** *3 credits (20 clinical hours)*  
Prerequisite: Permission of adviser. Investigation analysis, and selection of appropriate assessment instruments, as well as methodology for determining instructional objectives and activities for handicapped students. Three hour lecture.
- 590,1,2 WORKSHOP** *1-3 credits*  
Practical, intensive, and concentrated involvement with current curricular practices in areas related to physical education.
- 593 EDUCATIONAL INSTITUTES AND FOUNDATIONS** *1-4 credits*  
Practical experience with current research or curricular practices involving expert resource person with physical education, and usually financed by private or public funding.
- 601 SUPERVISION AND ADMINISTRATION OF PHYSICAL AND HEALTH EDUCATION, RECREATION AND DANCE** *3 credits*  
This course includes techniques of organization, administration and evaluation of education, recreation and dance programs, as well as administrative policies at the elementary, secondary, and college levels.
- 602 MOTOR BEHAVIOR** *3 credits*  
This course communicates knowledge of current research in human movement from a motor development and motor learning perspective. Individualizing teacher-coach decision-making based on skill analysis.
- 603 PHYSICAL EDUCATION AND HEALTH EDUCATION: INSTRUCTIONAL STRATEGIES** *3 credits*  
Discussion of curriculum development and instructional strategies for developing and implementing sound programs.
- 604 CURRENT ISSUES IN PHYSICAL EDUCATION** *3 credits*  
This course represents a planned experience in interpretation and articulation of information within the context of selected aspects of current issues in sport.
- 605 PHYSIOLOGY OF MUSCULAR ACTIVITY AND EXERCISE** *3 credits*  
Functions of body systems and physiological effects of exercise. Laboratory experiences, lectures, discussions.
- 606 STATISTICS: QUANTITATIVE AND QUALITATIVE METHODS** *3 credits*  
Prerequisite: 5100/640. Research methods/designs, statistics (application and interpretation), use of computers and appropriate software as they relate to various disciplines in the area of physical activity.
- 609 MOTIVATIONAL ASPECTS OF PHYSICAL ACTIVITY** *3 credits*  
Analysis of factors influencing motivation of motor performance with emphasis on competition, audience effects, aggression.
- 680 SPECIAL TOPICS IN HEALTH AND PHYSICAL EDUCATION** *2-4 credits*  
(May be repeated) Prerequisite: permission of instructor. Group study of special topics in health and physical education and sports medicine.

- 695 **FIELD EXPERIENCE: MASTER'S** 1-6 credits  
Prerequisite: permission of adviser. Participation in a work experience related to physical education. The experience may not be part of current position. Documentation of project required.
- 697 **INDEPENDENT STUDY** 1-3 credits  
Prerequisite: Permission of adviser. In-depth analysis of current practices or problems related to physical education. Documentation of the study required.
- 698 **MASTER'S PROBLEM** 2-4 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in physical education.
- 699 **MASTER'S THESIS** 4-6 credits  
Prerequisite: permission of adviser. In-depth research investigation. Student must be able to demonstrate necessary competencies to deal with a research problem in physical education.

## OUTDOOR EDUCATION

### 5560:

- 550 **APPLICATION OF OUTDOOR EDUCATION TO THE SCHOOL CURRICULUM** 4 credits  
Provides knowledge, skills and techniques useful in application of outdoor education to school curriculum.
- 552 **RESOURCES AND RESOURCE MANAGEMENT FOR THE TEACHING OF OUTDOOR EDUCATION** 4 credits  
Resources and instructional techniques which are applicable to outdoor education; and in-depth study of methods and designs, unique to the process of teaching.
- 556 **OUTDOOR PURSUITS** 4 credits  
Investigation and participation in practical experiences in outdoor pursuits.
- 590 **WORKSHOP: OUTDOOR EDUCATION** 1-3 credits  
Practical application of contemporary idea, methodologies, knowledge relevant to outdoor education. Emphasis on participant involvement in educational practices, utilizing the natural environment.
- 594 **EDUCATIONAL INSTITUTES: OUTDOOR EDUCATION** 1-4 credits  
Practical experience with current research or curricular practices involving expert resource persons in outdoor education.
- 600 **OUTDOOR EDUCATION: RURAL INFLUENCES** 3 credits  
Prerequisite: 550 or 552. Utilization of resources of rural area as a learning/teaching environment. Content and methodology appropriate for teaching school-age children in rural setting.
- 605 **OUTDOOR EDUCATION: SPECIAL TOPICS** 2-4 credits  
(May be repeated with change in topic) Prerequisite: permission of instructor. Group and individual study of special topics of contemporary concern in outdoor education.
- 690 **PRACTICUM IN OUTDOOR EDUCATION** 2-4 credits (60-120 field hours)  
Prerequisites: 550, 552 and permission of adviser. Supervised practical experience with existing outdoor education programs. In conjunction with practical work student meets regularly with adviser.
- 695 **FIELD EXPERIENCE: MASTER'S** 2-6 credits (60-180 field hours)  
Prerequisite: permission of adviser. Participation and documentation of practical professional experience related to outdoor education.
- 697 **INDEPENDENT STUDY** 1-3 credits (70-90 field hours)  
Prerequisite: permission of adviser. In-depth analysis of current practices or problems related to outdoor education. Documentation of study required.
- 698 **MASTER'S PROBLEM** 2-4 credits  
Prerequisite: permission of adviser. Intensive research study related to a problem in outdoor education or related discipline.
- 699 **MASTER'S THESIS** 4-6 credits  
An original composition demonstrating independent scholarship in a discipline related to outdoor education.

## HEALTH EDUCATION

### 5570:

- 521 **COMPREHENSIVE SCHOOL HEALTH** 4 credits  
Prerequisite: admission to Graduate School. This course explains and presents comprehensive school health curricula for K-12. The three components of a comprehensive school health program are presented; instruction, services, and the environment.

## EDUCATIONAL GUIDANCE AND COUNSELING

### 5600:

- 550 **COUNSELING PROBLEMS RELATED TO LIFE-THREATENING ILLNESS AND DEATH** 3 credits  
Prerequisite: permission. Consideration of the global issues, current research, coping behavior, support systems and family and individual needs in regard to life-threatening situations.
- 590,1,2 **WORKSHOP** 1-3 credits  
Special instruction designed as in-service and/or upgrading individuals on current issues and practices in counseling.
- 593 **WORKSHOP** 1-4 credits  
Special instruction designed as in-service and/or upgrading individuals on current issues and practices in counseling.
- 594 **COUNSELING INSTITUTE** 1-4 credits  
In-service programs for counselors and other helping professionals.
- 600 **SEMINAR IN COUNSELING** 1 credit  
Prerequisite: counseling majors must elect 600 prior to electing 651 and/or within the first 10 credits of 5600 course work. Structured group experience designed to help a student assess selection of counseling as a profession.

- 602 **INTRODUCTION TO COUNSELING** 2 credits  
Understanding guidance and counseling principles including organization, operation and evaluation of guidance programs (designed for non-counseling major).
- 610 **COUNSELING SKILLS FOR TEACHERS** 3 credits  
Prerequisite: 631 or 633 or permission. The study and practice of selected counseling techniques that can be applied by teachers in working with students, parents and colleagues.
- 620 **TOPICAL SEMINAR** 1-4 credits  
Prerequisite: permission of instructor. Seminar on a topic of current interest in the profession. Staffing will be by department faculty and other professionals in counseling and related fields. A maximum of eight credits may be applied to a degree.
- 631 **ELEMENTARY SCHOOL GUIDANCE** 3 credits  
Introductory course. examines guidance and counseling practices.
- 633 **SECONDARY SCHOOL GUIDANCE** 3 credits  
Introductory course. examines guidance and counseling practices.
- 635 **COMMUNITY COUNSELING** 3 credits  
Overview of community and college counseling services; their evaluation, philosophy, organization and administration.
- 643 **COUNSELING THEORY AND PHILOSOPHY** 3 credits  
Examination of major counseling systems including client-centered, behavioral and existential theories. Philosophical and theoretical dimension stressed.
- 645 **TESTS AND APPRAISAL IN COUNSELING** 4 credits  
Prerequisites: 6100-640. Study of the nature of tests and appraisal in counseling including reliability, validity, test construction and selection, administration, scoring, and basic interpretation of selected measures.
- 646 **MULTICULTURAL COUNSELING** 3 credits  
Prerequisites: 643 or permission of instructor. An examination of multicultural counseling theory and research necessary to work with culturally diverse people.
- 647 **CAREER DEVELOPMENT AND COUNSELING ACROSS THE LIFE-SPAN** 3 credits  
Overview of career development and choice over the life-span. Personal, family, and societal characteristics that affect choice, career choice, and implementation are discussed.
- 648 **INDIVIDUAL AND FAMILY DEVELOPMENT ACROSS THE LIFESPAN** 3 credits  
An exploration of individual and family development. Emphasis will be placed on understanding the relationship between the individual and his/her family.
- 649 **COUNSELING AND PERSONNEL SERVICES IN HIGHER EDUCATION** 3 credits  
Prerequisite: 635 or permission of instructor. Counseling services as related to psychological needs and problems of the college student.
- 651 **TECHNIQUES OF COUNSELING** 3 credits  
Prerequisite: 643 or permission. Study and practice of selected counseling techniques and skills with emphasis on structuring, listening, leading and establishing a counseling relationship.
- 653 **GROUP COUNSELING** 4 credits  
Prerequisites: 643 and 645, or 3750:671 and 710 (703) or permission. Emphasis is placed on providing the student with the knowledge and understanding of theory, research and techniques necessary for conducting group counseling sessions.
- 655 **MARRIAGE AND FAMILY THERAPY: THEORY AND TECHNIQUES** 3 credits  
An overview of the theory and techniques of marital and family therapy, including exposure to the history, terminology and contributions of significant persons in the field.
- 657 **CONSULTANT: COUNSELING** 3 credits  
Prerequisites: 631, 651 or permission. Examination of consultation models with focus on process and product.
- 659 **ORGANIZATION AND ADMINISTRATION OF GUIDANCE SERVICES** 3 credits  
Prerequisite: 631 or 633 or permission. Development of a comprehensive articulated guidance and counseling program.
- 663 **SEMINAR IN SCHOOL COUNSELING** 3 credits  
Prerequisites: 633, 643, 645 and 647 Study of specific guidance techniques and materials useful to counselors working with the secondary school student, teacher and parents.
- 665 **SEMINAR: COUNSELING PRACTICE** 3 credits  
Prerequisite: 635 or permission. Study of topics of concern to a student specializing in community and college counseling. Topics may differ each semester according to students' needs.
- 667 **MARITAL THERAPY** 3 credits  
Prerequisite: 655. In-depth study of theories and interventions which focus on the nature and quality of marital relationships.
- 669 **SYSTEMS THEORY IN FAMILY THERAPY** 3 credits  
Prerequisite: 655. In-depth exploration of systems theory in family therapy. Major assumptions of systems theory will be examined and the implications for interventions will be explored.
- 670 **ADDICTION COUNSELING I: THEORY AND PRACTICE** 3 credits  
Prerequisite: a graduate course in research and counseling techniques or equivalent with instructor's permission. This course is designed to familiarize the student with the history, theoretical models, and the empirical foundations for addiction counseling.
- 675 **PRACTICUM IN COUNSELING I** 5 credits  
Prerequisite: 653. Supervised counseling experience with individuals and small groups.
- 676 **PRACTICUM IN COUNSELING II** 2-5 credits  
Prerequisite: 675. Advanced supervised counseling experience.
- 685 **INTERNSHIP IN COUNSELING** 1-4 credits  
(May be repeated for a total of 7 credit hours.) Prerequisite: 675. Paid or unpaid supervised experience in counseling.
- 695 **FIELD EXPERIENCE: MASTER'S** 1-10 credits  
Prerequisites: permission of adviser and department head. Placement in selected setting for purpose of acquiring experiences and/or demonstration skills related to student's counseling program.
- 697 **INDEPENDENT STUDY** 1-3 credits  
(May be repeated for a total of nine credits) Prerequisites: permission of adviser and department head. Specific area of investigation determined in accordance with student needs.
- 698 **MASTER'S PROBLEM** 2-4 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in educational guidance and counseling.
- 699 **MASTER'S THESES** 4-6 credits  
Prerequisites: permission of adviser and department head. In-depth study and analysis of counseling problem.
- 702 **ADVANCED COUNSELING PRACTICUM** 4 credits  
(May be repeated for a total of 12 credits) Prerequisite: doctoral residency or permission. Examination of theories of individual age group counseling along with supervised counseling experience in selected settings.

- 7078 SUPERVISION IN COUNSELING PSYCHOLOGY I, II** 3 credits each  
Prerequisite: doctoral residency or permission. Instruction and experience in supervising graduate student in counseling.
- 710 THEORIES OF COUNSELING AND PSYCHOTHERAPY** 4 credits  
Prerequisite: 3750/630 or departmental permission. Major systems of individual psychotherapy explored within a philosophy of science framework. Freudian, behavioral, Rogenian, cognitive and other. Includes research, contemporary problems and ethics.
- 711 VOCATIONAL BEHAVIOR** 4 credits  
Prerequisite: 3750/630 or departmental permission. Theories and research on vocational behavior and vocational counseling. Topics include major theories on vocational behavior, empirical research on these theories, applied work in vocational counseling and applied research.
- 712 PRINCIPLES AND PRACTICE OF INDIVIDUAL INTELLIGENCE TESTING** 4 credits  
Prerequisites: 630 or graduate standing in school psychology, and instructor's permission. History, principles and methodology of intelligence testing, supervised practice in administration, scoring and interpretation of individual intelligence tests for children and adults.
- 713 PROFESSIONAL, ETHICAL AND LEGAL ISSUES IN COUNSELING PSYCHOLOGY** 4 credits  
Prerequisite: doctoral residency or permission. Examination of major issues in the field such as the counselor as a professional and as a person, and issues, problems and trends in counseling.
- 714 OBJECTIVE PERSONALITY EVALUATION** 4 credits  
Prerequisites: completion of 3750/400/500, 3750/420/520, and 3750/750 or 5600/645 or permission. Study of the development, administration, and interpretation of objective instruments for personality assessment (MMPI, CPI, MBTI, 16 PF and selected additional inventories).
- 715 RESEARCH DESIGN IN COUNSELING I** 3 credits  
Prerequisite: doctoral residency or permission. Study of research designs, evaluation procedures and review of current research.
- 716 RESEARCH DESIGN IN COUNSELING II** 3 credits  
Prerequisite: 704. Computer analysis of data related to counseling problem Development of research proposal.
- 717 ISSUES OF DIVERSITY IN COUNSELING PSYCHOLOGY** 4 credits  
Prerequisites: 3750/630; one semester of practicum work. Critical examination and application of research and theory in counseling diverse populations, focusing on race/ethnicity, sex/gender, sexual orientation, age, disability, and spirituality.
- 718 HISTORY AND SYSTEMS IN PSYCHOLOGY** 2 credits  
Prerequisite: 3750/630. Philosophical and scientific antecedents of psychology and details of the development of systematic viewpoints in the 19th and 20th centuries.
- 720 TOPICAL SEMINAR: GUIDANCE AND COUNSELING** 1-3 credits  
Prerequisite: permission of instructor. A topical study with a variety of disciplinary input. Staffing will be by department faculty and other professionals in counseling and related fields. A maximum of six credits may be applied to a degree.
- 732 ADDICTION COUNSELING II: ASSESSMENT AND TREATMENT PLANNING** 3 credits  
Prerequisite: a graduate course in research, counseling techniques, and 670, or equivalent with instructor's permission. This course is designed to teach the student proficiency in the process of diagnosis and treatment planning utilizing a comprehensive biopsychosocial model.
- 734 ADDICTION COUNSELING III: MODELS AND STRATEGIES OF TREATMENT** 3 credits  
Prerequisite: a graduate course in research, 670, 732, or equivalent with instructor's permission. This course is designed to teach the student to utilize a broad range of treatment interventions matched to the full spectrum of client problems.
- 755 ASSESSMENT METHODS AND TREATMENT ISSUES IN MARRIAGE AND FAMILY THERAPY** 3 credits  
Prerequisites: doctoral standing or permission. Provides advanced counseling students with the knowledge and skills in assessment methods, techniques and instruments relevant to the practice of marriage and family therapy.
- 756 OUTCOME RESEARCH IN MARRIAGE AND FAMILY THERAPY** 3 credits  
Prerequisite: 667; 5100/640, 741 This course will provide an in-depth examination of marriage and family therapy outcome research.
- 796 COUNSELING PSYCHOLOGY PRACTICUM** 4 credits  
(May be repeated for a total of 12 credits) Advanced counseling psychology students will have supervised training with clients in a variety of settings and will focus on supervised development of specialized theoretical applications.
- 797 INDEPENDENT READING AND/OR RESEARCH IN COUNSELING PSYCHOLOGY** 1-5 credits  
(May be repeated) Prerequisite: permission of instructor. Independent readings and/or research in an area of counseling psychology under the direction of a faculty member.
- 895 FIELD EXPERIENCE: DOCTORAL** 1-6 credits  
(May be repeated) Prerequisite: doctoral candidate status. Placement in selected setting for purpose of acquiring experiences and/or developing skills related to student's doctoral program.
- 897 INDEPENDENT STUDY** 1-3 credits  
(May be repeated for a total of nine credits) Prerequisites: permission of adviser and department head. Specific area of investigation determined in accordance with student needs.
- 898 RESEARCH PROJECTS IN SPECIAL AREAS** 1-2 credits  
(May be repeated) Prerequisites: permission of adviser and department head. Study, analysis and reporting of counseling problem.
- 899 DOCTORAL DISSERTATION** 1-20 credits  
Prerequisites: permission of major doctoral adviser and department head. Study, design and analysis of counseling problem.
- 544 DEVELOPMENTAL CHARACTERISTICS OF INTELLECTUALLY GIFTED INDIVIDUALS** 3 credits  
Prerequisite: 440/540. Survey of etiology, diagnosis, classification and developmental characteristics of intellectually gifted individuals.
- 545 DEVELOPMENTAL CHARACTERISTICS OF ORTHOPEDICALLY HANDICAPPED INDIVIDUALS** 3 credits  
Prerequisite: 440/540. Etiology, diagnosis, classification, developmental characteristics of the orthopedically handicapped individuals.
- 546 DEVELOPMENTAL CHARACTERISTICS OF THE SEVERE BEHAVIOR HANDICAPPED** 3 credits  
Etiology, diagnosis, classification, developmental characteristics of the socially and emotionally maladjusted individuals.
- 550 SPECIAL EDUCATION PROGRAMMING: EARLY CHILDHOOD** 3 credits  
Typical and atypical developmental patterns of your children, assessment and implication of handicapping conditions with respect to early intervention and supportive services.
- 551 SPECIAL EDUCATION PROGRAMMING: ELEMENTARY LEVEL** 3 credits  
Prerequisite: 450/550. Educational implications in regard to assessment teaching strategies, adaptive materials, evaluations, that are necessary to meet the needs of elementary level exceptional children.
- 552 SPECIAL EDUCATION PROGRAMMING: SECONDARY/VOCATIONAL** 3 credits  
Prerequisite: 450/550. Study of diagnostic prescriptive service delivery systems designed to accommodate developmental patterns of secondary-level exceptional children.
- 555 EDUCATIONAL ADJUSTMENT FOR INTELLECTUALLY GIFTED INDIVIDUALS** 3 credits  
Prerequisite: 444/544. Study of programs, services and educational experiences designed to accommodate developmental patterns of intellectually gifted individuals.
- 556 SPECIAL EDUCATION PROGRAMMING: SEVERE BEHAVIOR HANDICAPPED** 3 credits  
Prerequisites: 446/546. Students will develop teaching materials, assessment techniques, and IEPs for SBH individuals. Data evaluation and theoretical orientations will be stressed.
- 557 SPECIAL EDUCATION PROGRAMMING: ORTHOPEDICALLY HANDICAPPED** 3 credits (20 field hours)  
Prerequisites: 445/545, 451/551, 452/552. Study of programs, services, educational experiences, and adaptations designed to accommodate individuals who are orthopedically handicapped and/or chronically health impaired.
- 558 INTERDISCIPLINARY PROGRAMMING IN SPECIAL EDUCATION** 3 credits  
Prerequisite: permission of instructor. A study of the programs, interdisciplinary services, educational techniques designed to accommodate the needs of MSPR multi handicapped and orthopedically handicapped individuals.
- 559 COMMUNICATION AND CONSULTATION WITH PARENTS AND PROFESSIONALS** 3 credits  
Prerequisite: 440/540. Provides the prospective special education teacher with skills in communication and consultation for working with parents of exceptional individuals and other professionals.
- 561 TECHNOLOGY AND MATERIALS APPLICATION IN SPECIAL EDUCATION** 3 credits  
Prerequisite: 5100/310 or permission of instructor. Microcomputer operation and programming in special education; operation and use of unique audio or visual tools for handicapped and/or adaptive use of traditional equipment; overview of curriculum materials designed for exceptional learner.
- 562 EDUCATING EXCEPTIONAL CHILDREN IN THE REGULAR CLASSROOM** 3 credits  
For non-special education majors, teaching and administrative personnel in the field. This course focuses on the skills and competencies needed (by regular educators) in working successfully with mainstreamed exceptional children.
- 563 ASSESSMENT IN SPECIAL EDUCATION** 3 credits  
Prerequisite: 440/540. Prepares student to select, administer and interpret formal and informal assessment procedures and use resulting data in planning educational programs for exceptional individuals.
- 565 NEUROMOTOR ASPECTS OF PHYSICAL DISABILITIES** 3 credits  
Prerequisites: 454/554 or 457/557 Provides the student with a basic knowledge of the human neuromuscular system and the impact of neuromuscular damage on the form and function of movement and behavior.
- 566 RECREATIONAL PROGRAMS FOR EXCEPTIONAL INDIVIDUALS** 3 credits  
Prerequisite: 440/540. Study experience which examines crafts and outdoor recreational programming for exceptional individuals.
- 567 CLASSROOM BEHAVIOR MANAGEMENT** 3 credits  
Review of behavior management principles, and the development of application models for exceptional children in the classroom.
- 568 ADVANCED BEHAVIOR MANAGEMENT** 3 credits  
Prerequisites: 467/567 Advanced techniques for remediating problematic behavior, establishing effective repertoires and evaluating research relevant to classroom management will be covered. Behavioral theory will be stressed.
- 570 CLINICAL PRACTICUM IN SPECIAL EDUCATION** 3 credits  
Prerequisite: permission of instructor. Provides a laboratory experience for students to conduct psychoeducational study with students exhibiting learning behavioral problems in school.
- 571 CLINICAL PRACTICUM IN SPECIAL EDUCATION** 3 credits  
Prerequisites: 444/544, 455/555. A supervised clinical experience with individuals or small groups designed to provide practice in diagnostic and instructional intervention with gifted students.
- 579 SEMINAR: INVITATIONAL STUDIES IN SPECIAL EDUCATION** 1-2 credits  
(May be repeated for a total of four credits) Topical study with a varied array of disciplinary input. Staffing will be invited members of allied and contributing professions active in management of exception children.
- 601 SEMINAR SPECIAL EDUCATION CURRICULUM PLANNING** 3 credits  
Prerequisite: certification in an area of special education. Study of curriculum planning practices unique to special education classes and services. Appropriate curriculum objectives for selected areas of instruction as well as effective organizational programs examined.
- 602 SUPERVISION OF INSTRUCTION** 3 credits  
Prerequisite: certification in an area of special education. Study of administration an supervisory practices unique to special education classes and services.
- 603 ASSESSMENT AND EDUCATIONAL PROGRAMMING** 3 credits  
Prerequisite: certification in an area of special education or permission of instructor. Overviews psychodiagnostic approach in assessment of handicapped individuals and examines methods for designing individual programming based on formal and informal assessment. Program management also examined.
- 604 EDUCATION AND MANAGEMENT STRATEGIES FOR PARENTS OF EXCEPTIONAL INDIVIDUALS** 3 credits  
Prerequisite: certification in special education and/or permission of instructor. Methods of working with parents to facilitate effective programs for handicapped individuals. Strategies for providing support and educational services for parents examined.

## SPECIAL EDUCATION

### 5610:

- 540 DEVELOPMENTAL CHARACTERISTICS OF EXCEPTIONAL INDIVIDUALS** 3 credits  
Identification, developmental characteristics, and treatment procedures for atypical children and youth in both regular and special education facilities.
- 541 DEVELOPMENTAL CHARACTERISTICS OF THE MENTALLY RETARDED** 4 credits  
Prerequisites: 440/540. A survey of the etiology, diagnoses, classification, and developmental characteristics of individuals with mental retardation and developmental disabilities. This course will include individuals classified at all levels of mental retardation: mild, moderate, severe, and profound.
- 543 DEVELOPMENTAL CHARACTERISTICS OF THE SPECIFIC LEARNING DISABLED** 3 credits  
Prerequisite: 440/540. Survey of etiology, diagnosis, classification and developmental characteristics of learning disabled individuals.

- 605 PROGRAM DEVELOPMENT AND SERVICE DELIVERY SYSTEMS** 3 credits  
Prerequisite: certification in special and/or permission of instructor. Provides strategies for community analysis, case findings, funding sources and practices, and development of program models and service delivery systems to serve the handicapped.
- 606 RESEARCH DESIGN AND PRACTICE IN SPECIAL EDUCATION** 3 credits  
Prerequisite: 5100.640. An in-depth examination of qualitative research, single subject design, hypothesis generation and methodological practices unique to individual research and its application to special populations.
- 612 SEMINAR: ISSUES IN SPECIAL EDUCATION** 3 credits  
Prerequisites: 25 hours of graduate study in special education and/or permission of the instructor. A culminating seminar for graduate students in special education designed to study, examine and reflect upon current trends, issues and practices.
- 691 STUDENT TEACHING SEMINAR** 1 credit  
Taken concurrently with Student Teaching. Review and discussion of issues raised during teaching experience.
- 692 STUDENT TEACHING: SCHOOL AUDIOLOGY** 6 credits  
Prerequisite: Permission of advisor. Directed teaching under supervision of a special teacher and a University supervisor.
- 693 STUDENT TEACHING: SPEECH LANGUAGE PATHOLOGY** 6 credits  
Prerequisite: Permission of advisor. Directed teaching under supervision of a special teacher and a University supervisor.
- 694 RESEARCH PROJECT IN SPECIAL AREA (SCHOLARLY PAPER)** 3 credits  
Prerequisite: Culminating experience in master's program. An in-depth study of an identified topic in a scholarly paper.
- 695 FIELD EXPERIENCE: MASTER'S** 1-4 credits  
(May be repeated for a total of eight credits) Designed to provide on-the-job experience in a special education program on an individual basis.
- 697 INDEPENDENT STUDY** 1-3 credits  
(May be repeated for a total of nine credits) Prerequisites: permission of adviser and supervisor of independent study. Specific area of investigation determined in accordance with student's needs.
- 698 MASTER'S THESIS** 2-4 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in special education.
- 699 MASTER'S THESIS** 4-6 credits  
Thorough study and analysis in depth of an educational problem; field projects in special areas; synthesis of existing knowledge in relationship to a specific topic.

## SCHOOL PSYCHOLOGY

### 5620:

- 590 WORKSHOP** 1-2 credits  
Prerequisite: permission of instructor. Opportune topical experience provided periodically as needed and/or as resources become available.
- 591,2 WORKSHOP** 1-3 credits each  
Prerequisite: permission of instructor. Opportune topical experience provided periodically as needed and/or as resources become available.
- 594 SCHOOL PSYCHOLOGY INSTITUTES** 1-4 credits  
Prerequisite: permission of instructor. Specifically designed learning experience for program graduate focusing on critical topics.
- 600 SEMINAR: ROLE AND FUNCTION OF THE SCHOOL PSYCHOLOGIST** 3 credits  
Prerequisite: permission of instructor. Seminar on role and function of school psychologist. The course, tailored to meet individual needs of trainees, is a consideration of professional standards of school psychology practice.
- 601 COGNITIVE FUNCTION MODELS FOR PRESCRIPTIVE EDUCATIONAL PLANNING** 3 credits  
Prerequisite: permission of instructor. Consideration of cognitive development theories and their application for educational programming.
- 602 BEHAVIORAL ASSESSMENT** 3 credits  
Prerequisite: permission of instructor. Overview of behavioral theory and its application focusing upon the role of the school psychologist as an agent of behavior change.
- 603 CONSULTATION STRATEGIES IN SCHOOL PSYCHOLOGY** 3 credits  
Prerequisite: permission of instructor. A consideration of consultant roles in the practice of school psychology as related to consultant process and with school and agency personnel, parents and children.
- 610 EDUCATIONAL DIAGNOSIS FOR SCHOOL PSYCHOLOGISTS** 4 credits  
Prerequisites: permission of instructor. Clinical study and application of current assessment approaches applicable in assessment of children's learning problems.
- 611 PRACTICUM IN SCHOOL PSYCHOLOGY** 4 credits  
Prerequisite: permission of instructor. Laboratory experience in psycho-educational study of individual children who have learning problems in school. (Repeat requirement).
- 630,1 INTERNSHIP IN SCHOOL PSYCHOLOGY: FALL/SPRING** 3 credits each  
Prerequisite: permission of instructor. Full-time paid work assignment under supervision of a qualified school psychologist for an academic year structured according to provisions of State Department of Education. Additional readings required.
- 640 FIELD SEMINAR I: CURRENT PROFESSIONAL TOPICS/ISSUES IN SCHOOL PSYCHOLOGY** 3 credits  
Prerequisite: permission of instructor. Consideration of pertinent topics/issues in practice of school psychology with emphasis upon field-based concerns of a practicing school psychologist.
- 641 FIELD SEMINAR II: LOW INCIDENCE/RELATED INQUIRIES** 3 credits  
Prerequisite: permission of instructor. Consideration of pertinent topics/issues in practice of school psychology with emphasis on field-based concerns of a practicing school psychologist.
- 694 RESEARCH PROJECT IN SPECIAL AREAS** 1-3 credits  
Prerequisite: permission of adviser. Study, analysis and reporting of school psychology problem.
- 695 FIELD EXPERIENCE: MASTER'S** 1-3 credits  
Prerequisite: permission of instructor. Practical school psychology-related experience in school setting.

- 697 INDEPENDENT STUDY** 1-4 credits  
Prerequisites: permission of adviser and supervisor of the independent study. Documentation of specific area of investigation. Nature of the inquiry to be determined by student-supervisor agreement.
- 698 MASTER'S PROBLEM** 2-4 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in school psychology.
- 699 MASTER'S THESIS** 4-6 credits  
Prerequisite: permission of instructor. Thorough study, analysis and reporting in depth of an educational problem; field projects in special areas; synthesis of existing knowledge in relationship to specific topic.

## MULTICULTURAL EDUCATION

### 5630:

- 581 MULTICULTURAL EDUCATION IN UNITED STATES** 3 credits  
Inquiry into multicultural dimensions of American education. Comparisons of urban, suburban and rural educational settings with reference to socioeconomic differences.
- 582 CHARACTERISTICS OF CULTURALLY DIVERSE POPULATIONS** 3 credits  
Characteristics of culturally diverse populations with focus on youth in low-income areas. Emphasis on cultural, social, economic and educational considerations and their implications.
- 583 PREPARATION FOR TEACHING CULTURALLY DIVERSE POPULATIONS** 3 credits  
Gain knowledge of learning styles; motivational, instructional, and management techniques; and prepare/adapt instructional materials for diverse populations.
- 584 PRINCIPLES OF BILINGUAL/MULTICULTURAL EDUCATION** 3 credits  
An introduction to the theoretic, cultural, sociolinguistic bases of bilingual/multicultural education. Legislation, court decisions, program implementation included.
- 585 TEACHING READING AND LANGUAGE ARTS TO BILINGUAL STUDENTS** 4 credits  
Prerequisite: permission of instructor. Course applies methodologies for teaching reading, language arts in the bilingual/multicultural classroom. The bilingual student's native language, culture stresses.
- 586 TEACHING MATHEMATICS, SOCIAL STUDIES AND SCIENCE TO BILINGUAL STUDENTS** 3 credits  
Prerequisites: elementary education majors, 5200.333, 336, 338; for secondary education majors, 5300.311 (science, social studies in the bilingual/multicultural classroom. Course applies methodologies for teaching mathematics, science, social studies in the bilingual multicultural classroom. The bilingual student's native language stressed.
- 587 TECHNIQUES FOR TEACHING ENGLISH AS A SECOND LANGUAGE IN THE BILINGUAL CLASSROOM** 4 credits  
Prerequisite: permission of instructor. Course includes teaching language skills to Limited English Proficient students in grades K-12, administration of language assessment tests, selection and evaluation of materials.
- 590 WORKSHOP: BILINGUAL/MULTICULTURAL** 1-3 credits  
Emphasizes development of teaching devices and/or curriculum units, demonstration of teaching techniques, utilization of community resources.
- 686 SEMINAR: EDUCATION OF CULTURALLY DIVERSE POPULATIONS** 2 credits  
Designed to help students become more knowledgeable about and work cooperatively with human/social service agencies to alleviate risk factors associated with diverse populations.

## EDUCATIONAL ADMINISTRATION

### 5700:

- 590,1,2,3 WORKSHOP** 1-3 credits  
Individual work under staff guidance on curriculum problems, utilization of community resources, planning of curriculum units.
- 594 EDUCATIONAL INSTITUTES** 1-4 credits  
Special courses designed as in-service upgrading programs, frequently provided with the support of curriculum units.
- 601 PRINCIPLES OF EDUCATIONAL ADMINISTRATION** 3 credits  
A perspective of educational administration and the context in which it operates, with emphasis on the processes, tasks, roles and relationships involved and career opportunities.
- 602 SCHOOL BUSINESS ADMINISTRATION** 2 credits  
An examination of the changing role of today's school business administrator and study of major business functions from the perspectives of principals, business administrators and superintendents.
- 603 ADMINISTRATION OF EDUCATIONAL PERSONNEL** 2 credits  
A perspective on human resources management and a practical orientation to the major dimensions of the personnel function.
- 604 SCHOOL-COMMUNITY RELATIONS** 3 credits  
An analysis of the principles, practices, and materials that facilitate the adjustment and interpretation of schools to their internal and external publics.
- 606 EVALUATION IN EDUCATIONAL ORGANIZATIONS** 3 credits  
An examination of the general concepts, models, practical applications and considerations involved in the evaluation of educational organizations including program evaluation, performance appraisal and operational evaluation.
- 607 SCHOOL LAW** 2 credits  
An examination of the legal principles underlying education in United States as reflected in statutory provisions, court decisions and administrative orders.
- 608 SCHOOL FINANCE AND ECONOMICS** 3 credits  
A study of financial operations of school systems, including taxes, other sources of revenue, expenditures, budgeting and the effects of economic factors.
- 609 PRINCIPLES OF CURRICULUM DEVELOPMENT** 3 credits  
An overview and analysis of educational and instructional programs emphasizing the basic purposes, functions and structures necessary to shape, implement and evaluate them.

- 610 PRINCIPLES OF EDUCATIONAL SUPERVISION** 3 credits  
Study of principles, organizations and techniques of supervision with view to improvement of instruction.
- 611 SUPERVISION OF STUDENT TEACHING** 2 credits  
Primarily for supervising teachers in guidance of student teachers. Topics include readiness for student teaching, directing teacher and college supervisor relationships, use of the conference, demonstration and observation.
- 612 ADMINISTRATION OF EDUCATIONAL FACILITIES** 2 credits  
A comprehensive view of the principles, practices and new dimensions involved in the planning and management of educational facilities.
- 613 ADMINISTRATION OF PUPIL SERVICES** 2 credits  
Overview of pupil services including analysis of the nature and development of each component program and discussion of current issues and trends.
- 615 COMPUTER APPLICATIONS IN EDUCATIONAL ADMINISTRATION** 2 credits  
A practical course providing hands-on experience with basic software programs, computer assisted instruction and word processing for administrators and educational organizations.
- 620 SECONDARY SCHOOL ADMINISTRATION** 3 credits  
An orientation to the secondary principal's role and working relationships and an examination of the principles and strategies involved in successfully administering a secondary school.
- 631 ELEMENTARY SCHOOL ADMINISTRATION** 3 credits  
Examination of the elementary school principalship as it relates to the development and maintenance of a school climate most conducive to learning.
- 684 FIELD EXPERIENCE I: ELEMENTARY ADMINISTRATION** 2 credits  
A supervised, on-the-job administration experience in staff personnel, pupil personnel, curriculum, community relations, finance and physical facilities.
- 686 FIELD EXPERIENCE I: SECONDARY ADMINISTRATION** 2 credits  
A cooperative field-based experience in a secondary school involving observation and activities in the administrative task areas.
- 694 FIELD EXPERIENCE II: ELEMENTARY ADMINISTRATION** 3 credits  
Prerequisites: 684 and permission of instructor. Culmination of the preparatory program for elementary school principals in which students perform administrative tasks supervised by experienced principals.
- 695 FIELD EXPERIENCE FOR SUPERVISORS** 3 credits  
Prerequisite: completion of all course work in the program. Designed to help the student apply the knowledge and skills related to direct assistance, curriculum development, in service/staff development, group work, and action research.
- 696 FIELD EXPERIENCE II: SECONDARY ADMINISTRATION** 3 credits  
A cooperative, field-based experience in a secondary school with emphasis on project performance in the administrative task areas.
- 697 INDEPENDENT STUDY** 1-3 credits  
(May be repeated for a total of six credits) Prerequisites: permission of adviser and supervisor of the independent study. Area of study determined by student's needs.
- 698 MASTER'S PROBLEM** 2-4 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in educational administration.
- 699 MASTER'S THESIS** 4-6 credits  
Prerequisite: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in educational administration.
- 704 ADVANCED PRINCIPLES OF EDUCATIONAL ADMINISTRATION** 2 credits  
Study of organizations and strengths and weaknesses of common methods of administering them. Practical means by which overcoming bureaucratic weaknesses of bureaucracies are offset or lessened in educational institutions.
- 705 DECISION MAKING IN EDUCATIONAL ADMINISTRATION** 3 credits  
Decision making is portrayed as a central function of the educational administrator with a united presentation of the theory, research and practice of decision making.
- 706 COLLECTIVE BARGAINING AND EMPLOYEE RELATIONS** 2 credits  
An overview of collective bargaining in education and a comprehensive look at the mechanics and issues involved in the bargaining process and contract administration.
- 707 THE SUPERINTENDENCY** 3 credits  
An orientation to the superintendent's role and an examination of the strategies for dealing with the major relational and functional aspects of the superintendency.
- 720 TOPICAL SEMINAR: EDUCATIONAL ADMINISTRATION** 1-3 credits  
(May be repeated) Prerequisite: permission of instructor. Topical studies in selected areas of concern to students, practicing administrators in public, private educational institutions, organizations.
- 730 RESIDENCY SEMINAR** 3 credits  
Prerequisite: 601. Focus on recent research in administration and educational administration theory.
- 731 RESIDENCY SEMINAR** 3 credits  
Current administrative problems in educational institutions as perceived by student and practicing school executives. Emphasis on problem management, amelioration or solution. Field visits or resource persons invited to classroom.
- 732 ORGANIZATIONAL COMMUNICATIONS AND THE SCHOOL ADMINISTRATOR** 3 credits  
Fundamentals in interpersonal communication, application of these principles to roles of educational administrators. Skill development in written and spoken communications, with attention to nonverbal communications; simulation and role playing.
- 733 THE EDUCATIONAL ADMINISTRATOR AND PLANNED CHANGE** 2 credits  
Prerequisites: 601 and 704. Relationship between technological and social change and needed change in education; theories, principles and mechanisms in planned educational change.
- 740 THEORIES OF EDUCATIONAL SUPERVISION** 3 credits  
Prerequisites: 610, 5200/732 or 5300/721. Extends 5700/610, including supervisory models, staff development, and the organizational environment's impact on the climate for effective supervision.
- 745 PRACTICUM IN EDUCATIONAL ADMINISTRATION: URBAN SETTING** 2 credits  
Prerequisite: completion of three-fourths of doctoral program courses. Analysis of uniqueness of urban setting, e.g., multicultural and pluralistic urban populations. Stress on administrator's human relation skills.
- 746 POLITICS, POWER AND THE SCHOOL ADMINISTRATOR** 3 credits  
Impacts of formal and informal community power structures and influential persons on educational planning and decision making. Administrator as an influence on the power structure for educational benefit.

- 747 PRACTICUM: COMPETING AND COMPLEMENTARY SOCIAL SYSTEMS** 3 credits  
Designed to bring educational administrator into direct contact with individuals responsible for other community service delivery systems, e.g., city government. Methods of interagency cooperation to provide client services.
- 795,6 INTERNSHIP IN EDUCATIONAL ADMINISTRATION** 2 credits each  
(May be repeated for a total of six credits) Work under a practicing administrator involving experience in optimum number of administrative tasks. Includes seminars and written work.
- 895 FIELD EXPERIENCE: THE SUPERINTENDENCY** 2 credits  
Prerequisite: permission of instructor. Cooperative, field-based experience in central office of a school district in which student performs assignments in administrative task areas.
- 896 FIELD EXPERIENCE IN SCHOOL PLANT PLANNING** 2 credits  
Prerequisites: permission of instructor. Selected field experiences. Emphasis on analysis of school enrollments; evaluation of school plants and financial aspects of plant planning.
- 897 INDEPENDENT STUDY** 1-3 credits  
(May be repeated for a total of six credits) Prerequisites: permission of adviser. In-depth study of a research problem in education. Student must be able to demonstrate critical and analytical skills in dealing with a problem in secondary education.
- 898 RESEARCH PROJECT IN SPECIAL AREAS** 1-2 credits  
Prerequisite: permission of adviser. Critical and in-depth study of specific problem in educational administration.
- 899 DOCTORAL DISSERTATION** 1-20 credits  
Prerequisite: permission of adviser. Specific research problem that requires student to apply research skills and techniques to the problem being studied.

## SPECIAL EDUCATIONAL PROGRAMS

### 5800:

- 590 WORKSHOP IN ECONOMIC EDUCATION OR IN SOCIAL STUDIES** 1-3 credits  
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.
- 591 WORKSHOP IN ARITHMETIC OR IN PHYSICAL SCIENCE** 1-3 credits  
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.
- 592 WORKSHOP IN READING** 1-3 credits  
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.
- 593 WORKSHOP ON EXCEPTIONAL CHILDREN** 1-3 credits  
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.
- 594 INTERNATIONAL SCHOOL STUDY** 3-6 credits  
On-the-scene study of education in foreign countries, usually by concentrating on the study of schools in one restricted geographical area.

# College of Business Administration

## ACCOUNTANCY

### 6200:

- 520 ADVANCED ACCOUNTING** 3 credits  
Prerequisite: 622. Examination of accounting theory emphasizing accounting for business combinations, partnerships, foreign operations, nonprofit entities and consolidated statements.
- 530 TAXATION I** 3 credits  
Prerequisite: 320 or 620. Federal tax law related to individuals, partnerships, and corporations. Master of Taxation students will not be able to take this course to satisfy tax electives in the Master of Taxation program.
- 531 TAXATION II** 3 credits  
Prerequisite: 430/530 or permission. Additional aspects of individual taxation, Federal tax law related to property transfers and retirement and family tax planning.
- 540 AUDITING** 3 credits  
Prerequisite: 621. Examines auditing standards and procedures used by independent auditor in determining whether a firm has fairly represented its financial position.
- 570 GOVERNMENTAL AND INSTITUTIONAL ACCOUNTING** 3 credits  
Prerequisites: 320 or 601. Theory and procedures involved in application of fund accounting, budgetary control, appropriations and various accounting systems to governmental units, educational, medical and other nonprofit institutions.
- 580 ACCOUNTING PROBLEMS** 3 credits  
Prerequisite: 322. Independent research on advanced accounting problem in student's specific area of interest.
- 588 CPA PROBLEMS: AUDITING** 2 credits  
Prerequisite: 440/540 or permission of instructor. Preparation for auditing section of CPA examination, focusing on auditing principles, standards and ethics and situations encountered by independent auditor.
- 589 CPA PROBLEMS: THEORY** 2 credits  
Prerequisite: permission of instructor. Preparation for theory section of CPA examination, focusing on current developments and use of basic accounting theory to solve advanced accounting problems.
- 590 SPECIAL TOPICS IN ACCOUNTING** 1-3 credits  
Prerequisite: Permission of instructor. Opportunity to study special topics and current issues in accounting. May be repeated with a change of subject but not to exceed 6 credits.
- 591 WORKSHOP IN ACCOUNTING** 1-3 credits  
(May be repeated) Prerequisite: permission of instructor. Group study of accounting under faculty guidance. May not be used to meet undergraduate or graduate accounting major requirements, but may be used for elective credit only with permission of instructor or department.
- 601 FINANCIAL ACCOUNTING** 3 credits  
Introductory course for student with no accounting background. Examines accounting principles as applied to financial problems of firm.
- 603 BUSINESS SYSTEMS WITH PROCESSING APPLICATIONS** 3 credits  
Prerequisite: 601. Introduction to basic concepts in concepts in computer technology, steps in system development and logic of designing accounting systems by using a business-oriented language or related software.
- 610 ACCOUNTING MANAGEMENT AND CONTROL** 3 credits  
Prerequisite: 601 or equivalent. Investigation of role of accounting as management tool in areas of production, marketing, internal control and capital budgeting with focus on management planning.
- 621 CORPORATE ACCOUNTING AND FINANCIAL REPORTING I** 3 credits  
Prerequisite: 601. An examination of generally accepted accounting principles in theory and application, as well as financial statement preparation.
- 622 CORPORATE ACCOUNTING AND FINANCIAL REPORTING II** 3 credits  
Prerequisite: 621. A continuation of 6200:621 which examines generally accepted accounting principles in theory and practice, as well as financial statement preparation.
- 627 SURVEY OF FEDERAL TAXATION** 3 credits  
Prerequisites: 601 or equivalent. Introduction to federal taxation for students who have not yet completed more than one undergraduate or graduate tax course. Examines individual and business federal taxation. Completion of this course will not count towards fulfilling the requirements of the Master of Taxation degree.
- 628 BASIC TAX RESEARCH** 1 credit  
Prerequisites: completion of M.Tax foundation courses. Designed to develop basic research competence involving federal income, estate, and gift tax laws.
- 631 CORPORATE TAXATION I** 3 credits  
Prerequisite: completion of M.Tax foundation courses. Detailed examination of tax problems of corporations and their shareholders. Formation, distribution, redemption, liquidation and penalty taxes covered.
- 632 TAXATION OF TRANSACTIONS IN PROPERTY** 3 credits  
Prerequisite: completion of M.Tax foundation courses. Explores federal tax implications of gains and losses derived from sales, exchanges and other dispositions of property.
- 633 ESTATE AND GIFT TAXATION** 3 credits  
Prerequisite: completion of M.Tax foundation courses. Analyzes provisions of federal estate and gift tax laws and tax consequences of testamentary and lifetime transfers.
- 637 ADVANCED ACCOUNTING THEORY** 3 credits  
Prerequisite: 318. Examination of accounting concepts and standards through critical analysis of articles on current trends in profession. Discussion and outside research stressed.
- 640 ADVANCED AUDITING** 3 credits  
Prerequisite: 440/540. Conceptual foundations and current research on professional and internal auditing. Includes government regulation and litigation, statistics, computer systems as well as current and prospective developments in auditing.
- 641 TAXATION OF PARTNERSHIPS AND S CORPORATIONS** 3 credits  
Prerequisite: completion of M.Tax foundation courses. Examines intensive provisions of subchapters K and S of Internal Revenue Code and uses of partnerships and subchapter S corporations for tax planning.
- 642 CORPORATE TAXATION II** 3 credits  
Prerequisite: 631. Continuation of 631. Concludes study of subchapter C on Internal Revenue Code with major focus on corporate reorganization.
- 643 TAX ACCOUNTING** 2 credits  
Prerequisite: completion of M.Tax foundation courses. Attention focused on timing of income and expenses for individuals businesses and its relation to tax planning.
- 644 INCOME TAXATION OF DECEDENTS, ESTATES AND TRUSTS** 2 credits  
Prerequisite: 633. An in-depth examination of the decedent's last income tax return along with the analysis of income taxation of trusts and estates and their creators, fiduciaries and beneficiaries.
- 645 ADVANCED INDIVIDUAL TAXATION** 3 credits  
Prerequisite: 430/530. In-depth study of some of the more involved areas of individual income taxation.
- 646 CONSOLIDATED TAX RETURNS** 2 credits  
Prerequisite: completion of M.Tax foundation courses. Intensive study of tax provisions concerning use of consolidated tax returns.
- 647 QUALIFIED PENSIONS AND PROFIT SHARING** 3 credits  
Prerequisite: completion of M.Tax foundation courses. Nature, purpose and operation of various forms of deferred compensation examined with much emphasis on pension and profit-sharing plans.
- 648 TAX PRACTICE AND PROCEDURE** 2 credits  
Prerequisite: completion of M.Tax foundation courses. In-depth study of administration and procedures of Internal Revenue Service and responsibilities of tax practitioner.
- 649 STATE AND LOCAL TAXATION** 2 credits  
Prerequisite: 631. Examines common types of taxes imposed by state and local governments and includes taxation of multistate businesses.
- 650 ESTATE PLANNING** 2 credits  
Prerequisite: 633. Considers entire process of planning the estate with due regard for disposition of property, tax minimization, liquidity requirements and administrative costs.
- 651 UNITED STATES TAXATION AND TRANSNATIONAL OPERATIONS** 2 credits  
Prerequisite: completion of M.Tax foundation courses. Examines United States taxation of foreign income of domestic corporations, citizens and residents, as well as United States income of nonresident aliens and foreign corporations.
- 652 TAX-EXEMPT ORGANIZATIONS** 2 credits  
Prerequisite: completion of M.Tax foundation courses. Analysis of tax aspect of tax-exempt organizations, including nature of and limitations of its exemption.
- 653 BUSINESS PLANNING** 2 credits  
Prerequisite: 631. Uses cases depicting complex problems to permit student to integrate knowledge of taxation.
- 654 INDEPENDENT STUDY IN TAXATION** 1-3 credits  
Prerequisite: permission of instructor. Intensive study of particular topic or limited number of topics not otherwise offered in curriculum. (May be repeated for a total of six credits.)
- 655 ADVANCED INFORMATION SYSTEMS** 3 credits  
Prerequisites: 603 or equivalent and 610. Advanced study of accounting information system theory, elements, principles, design and implementation. Practical data processing and networks to control flow of information.
- 656 NON-QUALIFIED EXECUTIVE COMPENSATION** 2 credits  
Prerequisite: 631. Various non-qualified executive compensation items are analyzed. The effects to both the recipients and payor entities are determined and discussed.
- 661 ADVANCED TAX RESEARCH AND POLICY** 3 credits  
Prerequisite: 628 and completion of four other tax courses in Phase II. Extensive research involving federal income, estate, trust and gift taxes as well as tax policy.
- 664 RESEARCH AND QUANTITATIVE METHODS IN ACCOUNTING** 3 credits  
Prerequisites: 6200:610, 6500:601 or equivalent. Survey of research techniques, statistical methods, and data bases with applications to accounting and business functional areas.
- 670 COST CONCEPTS AND CONTROL** 3 credits  
Prerequisite: 6400:650 and either 6200:460 or 610. Focus on analysis and control of costs and their uses in decision making. Determination of cost data and efficiency of decision emphasized.
- 680 INTERNATIONAL ACCOUNTING** 3 credits  
Prerequisite: 610. Examination of accounting theory and practice from international perspective with emphasis on multinational investment, business and auditing activities and reporting problems.
- 690 SEMINAR IN TAXATION** 3 credits  
(May be repeated for a total of six credits.) Prerequisites: completion of M.Tax foundation courses. Program of studies in the tax area of student's choice, in which a finished report is required.
- 693 SELECTED TOPICS IN TAXATION** 1-3 credits  
(May be repeated for a total of six credits.) Prerequisites: completion of M.Tax foundation courses. Provides study in contemporary issues in taxation that are not covered in current courses.
- 695 GRADUATE INTERNSHIP IN ACCOUNTING** 3 credits  
Prerequisites: 601, 621, 610, and 655. This course provides an opportunity for graduate accounting students to apply classroom instruction to practice problems in a professional working environment.
- 697 INDEPENDENT STUDY IN ACCOUNTING** 1-3 credits  
(May be repeated for a total of six credits) Focus on special topics of study and research in accounting on an independent basis.

**FINANCE****6400:**

- 591 WORKSHOP IN FINANCE** *1-3 credits*  
(May be repeated) Group studies or special topics. May not be used to meet undergraduate or graduate major requirements in finance. May be used for elective credit only with permission of instructor or department.
- 602 MANAGERIAL FINANCE** *3 credits*  
Prerequisite: 6200:601 or equivalent. 6400:602 may be taken concurrently with 6200:601. Emphasis on financial decision making related to goal of firm, specifically, the investment decision, the financial decision and the dividend decision.
- 623 LEGAL ASPECTS OF BUSINESS TRANSACTIONS** *3 credits*  
(Not open to students with six credits of undergraduate business law.) Advanced legal analysis of contracts, UCC, debtor-creditor relationships, business organizations, property, and government regulation.
- 631 FINANCIAL MARKETS AND INSTITUTIONS** *3 credits*  
Prerequisite: 602 or equivalent. A study of major financial markets and financial institutions with an emphasis on the decision making processes within a rapidly changing, but regulated operating environment.
- 633 MANAGEMENT OF DEPOSITORY FINANCIAL INSTITUTIONS** *3 credits*  
Prerequisites: 602 and 6500:602. Policy determination, administrative decision making in banks, savings and loans using computer simulation games.
- 645 INVESTMENT ANALYSIS** *3 credits*  
Prerequisite: 602 or equivalent. Study of the economic and market forces that influence security prices. Techniques of analysis used in evaluating limited income and equity securities.
- 647 OPTIONS, FUTURES AND SPECULATIVE MARKETS** *3 credits*  
Prerequisites: 602 or equivalent. A study of the applications and practice of options, futures and other speculative markets.
- 649 PORTFOLIO MANAGEMENT** *3 credits*  
Prerequisite: 645 or permission of instructor. Advanced techniques used by sophisticated individuals, professional managers of large portfolios.
- 650 ADMINISTERING COSTS AND PRICES** *3 credits*  
Prerequisite: 3250:600 and 6500:601. Provides an understanding of managerial economics. Short- and long-run decisions of firm analyzed. Analysis includes impact of costs and prices on business profitability.
- 655 GOVERNMENT AND BUSINESS** *3 credits*  
Public policy with regard to business institutions and issues are considered from an economic, legal, ethical, political framework.
- 674 FINANCIAL MANAGEMENT AND POLICY** *3 credits*  
Prerequisite: 602 and 6500:602. Working capital management, controlling inventory, investments, administering costs and funds, managing investment in plant and equipment, administering business income and forecasting for financial management.
- 676 MANAGEMENT OF FINANCIAL STRUCTURE** *3 credits*  
Prerequisite: 602 or equivalent. Emphasizes determination of volume and composition of sources of funds. Primary attention directed to cost of capital for specific sources of financing.
- 678 CAPITAL BUDGETING** *3 credits*  
Prerequisite: 602 or equivalent. Attempt to integrate various theories of capital budgeting into comprehensive conceptual scheme. Theoretical concepts and practical applications blended for better understanding of capital problems.
- 681 MULTINATIONAL CORPORATE FINANCE** *3 credits*  
Prerequisite: 602 or equivalent. Financial policies and practices of companies involved in multinational operations. Considers management of working capital and permanent assets, return on investment and capital budgeting for the global firm.
- 690 SELECTED TOPICS IN FINANCE** *3 credits*  
(May be repeated for a total of six credits) Prerequisite: 602 or equivalent. Provides study of contemporary issues and areas not covered in current finance graduate courses.
- 691 INTERNATIONAL MARKETS AND INVESTMENTS** *3 credits*  
Prerequisites: 602 or equivalent. A study of international financial markets with an emphasis on international investments and risks in a rapidly changing global economy.
- 697 INDEPENDENT STUDY IN FINANCE** *1-3 credits*  
(May be repeated for a total of six credits) Focus on special topics of study and research in finance on an independent basis.
- 698 INDEPENDENT STUDY: BUSINESS LAW** *1-3 credits*  
(May be repeated for a total of six credits) Focus on special topics of study and research in the legal aspects of business administration.

**MANAGEMENT****6500:**

- 508 ENTREPRENEURSHIP** *3 credits*  
Prerequisites: upper-college or graduate standing and 301 or 600 or equivalent. Examines the behavior and environment for entrepreneurship. Focuses on classic and contemporary entrepreneurs and the importance of personal values and strategies. Case studies. Field projects.
- 510 SELECTED TOPICS IN ENTREPRENEURSHIP** *1-3 credits*  
Prerequisites: upper-college or graduate standing and 301 or 600 or equivalent. Facilitates comparative international study of entrepreneurship, introduction of entrepreneurship to large organizations, or application of student's entrepreneurial skills. Six hour limit.
- 512 DEVELOPMENT OF MANAGEMENT THOUGHT** *3 credits*  
Prerequisites: upper-college or graduate standing and 301, or 600 or equivalent. Review of development of managerial theories from 5000 B.C. to present with consideration of their application to present organizational settings.
- 555 MANAGEMENT OF ARBITRATION: COMMERCIAL, INTERNATIONAL AND HUMAN RESOURCES** *3 credits*  
Prerequisites: upper-college or graduate standing and 301 or 600 or equivalent. A comprehensive study of managerial strategies for commercial, international and human resource arbitration. Graduate requirement: research paper.
- 571 MANAGEMENT PROJECT** *3 credits*  
Prerequisite: 670. Student applies modern management principles, practices, theory to an actual problem in industry.

- 580 INTRODUCTION TO HEALTH-CARE MANAGEMENT** *3 credits*  
Prerequisites: upper-college or graduate standing (Students who are required to take 301 or 600 or have completed 301 or 600 or equivalent are ineligible to take this course for credit). Introductory course for health professionals covering principles and concepts of management applied to health services organizations. For those registered for graduate credit, a major paper is required.
- 582 HEALTH SERVICES OPERATIONS MANAGEMENT** *3 credits*  
Prerequisites: 580 or 600 or equivalent or permission of instructor. Application of operations and systems analysis to health services organizations.
- 585 SPECIAL TOPICS IN HEALTH SERVICES ADMINISTRATION** *1-3 credits*  
Prerequisite: permission of instructor. Special topics in health services administration (e.g., management) focusing on historical and/or contemporary managerial organizational and/or policy/strategy issues as related to health-care organizations and health-care systems. Separate topics may be repeated for a maximum of six credits. For those registered for graduate credit, a major research paper is required.
- 600 MANAGEMENT AND ORGANIZATIONAL BEHAVIOR** *3 credits*  
Course examines management principles, concepts, functions and process, as well as human behavior in organizations.
- 601 QUANTITATIVE DECISION MAKING** *3 credits*  
Prerequisite: finite mathematics. Applies quantitative techniques to business decision making. Topics covered include probability estimation and hypothesis testing, simple and multiple regression and correlation analysis, analysis of variance and nonparametric statistics.
- 602 COMPUTER TECHNIQUES FOR MANAGEMENT** *3 credits*  
Introduction to the use of integrated spreadsheet software, database management software and the analysis and design of management information systems.
- 640 MANAGEMENT INFORMATION SYSTEMS** *3 credits*  
Prerequisite: 602 or equivalent. An introduction to systems design, management information systems, data base management, their relationships to problem solving and the organization.
- 641 DATA MANAGEMENT AND COMMUNICATION** *3 credits*  
Prerequisite: 602. The effective management of the data resources of the firm are examined as well as how data communications are changing the way businesses operate.
- 642 SYSTEMS SIMULATION** *3 credits*  
Prerequisites: 601, 602. Manufacturing or service sector systems are analyzed and modeled on a computer. Experimental designs, statistical significance of results, model verification and validation will be discussed.
- 643 ANALYSIS AND DESIGN OF BUSINESS SYSTEMS** *3 credits*  
Prerequisite: 602. A hands-on treatment of the methods used to develop different types of business information systems.
- 644 MANAGERIAL DECISION SUPPORT AND EXPERT SYSTEMS** *3 credits*  
Prerequisite: 6500:602. Examines decision support systems and the application of artificial intelligence based systems in today's business environment.
- 645 ADVANCED MANAGEMENT INFORMATION SYSTEMS** *3 credits*  
Prerequisite: 640. A case-oriented course which examines the problems of managing the Corporate Information Systems activity as regarded by users, general management and IS management.
- 650 FUNDAMENTALS OF HUMAN RESOURCE ADMINISTRATION** *3 credits*  
Prerequisite: 600. A broad survey of the fundamental principles, research findings and practices related to the acquisition, development, maintenance and effective utilization of a business firm's human resources.
- 651 PRODUCTIVITY AND QUALITY OF WORKLIFE ISSUES** *3 credits*  
Prerequisite: 600 or equivalent. A comprehensive study of innovations in organizations designed to increase human satisfaction and productivity through changes in human management.
- 652 ORGANIZATIONAL BEHAVIOR** *3 credits*  
Prerequisite: 600 or equivalent. Study of factors which influence human behavior in business organizations. Emphasis on theories of individual and group behavior, motivation, leadership and communication in organizations.
- 653 ORGANIZATIONAL THEORY** *3 credits*  
Prerequisite: 600. Examines the structure, design and overall effectiveness of a business organization from a macro-perspective.
- 654 INDUSTRIAL RELATIONS** *3 credits*  
Prerequisite: 600. Study of rights and duties of management in dealing with labor and economic consequences of union and management policies and practices.
- 655 COMPENSATION ADMINISTRATION** *3 credits*  
Prerequisite: 600. A comprehensive approach toward the identification and resolution of pay and benefit problems facing business organization in their internal and external labor markets.
- 656 MANAGEMENT OF INTERNATIONAL OPERATIONS** *3 credits*  
Prerequisite: 600 or equivalent. Deals with institutional environment of international business; parameters of international business system which hold the system together and which individual business people cannot materially alter.
- 657 THE LEADERSHIP ROLE IN ORGANIZATIONS** *3 credits*  
Prerequisite: 652. Analysis and development of leadership theory and thought. Identification of leaders in both formal and informal organizations. Training and development methods of leaders evaluated. Individual and small group field study assignments.
- 658 STRATEGIC HUMAN RESOURCES MANAGEMENT** *3 credits*  
Prerequisites: 600 or equivalent and 654. The formulation, design and implementation of strategic human resource practices and systems for business organizations. Emphasis is on competitive cost advantages and productivity gains.
- 660 EMPLOYMENT REGULATION** *3 credits*  
Prerequisite: 600 or equivalent. A broad overview of the federal legislation regulating the business firm's human resource management function.
- 662 APPLIED OPERATIONS RESEARCH** *3 credits*  
Prerequisite: 601 or equivalent. Survey of basic techniques of operations research. Stresses application to functional area of business.
- 663 DATA ANALYSIS FOR MANAGERS** *3 credits*  
Prerequisite: 601 or equivalent. The course proceeds from problem recognition and formulation of effective/efficient data collection plans to quantitative data analysis and presentation of statistical/practical conclusions and recommendations.
- 664 APPLIED INDUSTRIAL STATISTICS** *3 credits*  
Prerequisite: 601 or equivalent. Applications of multiple regression including determining "best" set of independent variables, correlation models, analysis of variance models including multifactor models. Experimental designs including randomized block and Latin square designs.

- 670 OPERATIONS MANAGEMENT** 3 credits  
Prerequisites: 600, 601 or equivalent. An overview of the strategic, tactical and operational issues directly related to the creation of goods and services.
- 671 ADVANCED OPERATIONS RESEARCH** 3 credits  
Prerequisite: 662. Designed to present in more depth and breadth certain topics surveyed in 662, with emphasis on application of these techniques to student's own business situations.
- 673 QUALITY AND PRODUCTIVITY TECHNIQUES** 3 credits  
Prerequisite: 601. Introduction to techniques for improving productivity and quality, including statistical process control (SPC), material requirements planning (MRP), just-in-time (JIT) inventory control and management of the program.
- 674 ADVANCED QUALITY AND PRODUCTIVITY TECHNIQUES** 3 credits  
Prerequisites: 673. Examines advanced techniques in statistical process control, experimental design, determination of customer quality needs/customer service, product reliability/liability and management of quality systems.
- 675 MATERIALS MANAGEMENT** 3 credits  
Prerequisite: 600. Surveys functions and explores opportunities for profit improvement and cost reduction in those functions integrated under the organizational concept of materials management.
- 676 MANAGEMENT OF PRODUCTION AND OPERATIONS** 3 credits  
Prerequisites: 600, 602, 662. Surveys the management of resources required to transform inputs into products or services. Addresses issues related to services, materials, people and equipment utilized for production.
- 678 PROJECT MANAGEMENT** 3 credits  
Prerequisites: 600, 601, 602. Provides working knowledge of tools and methods available to project managers including computerized analysis of network models to aid in the planning and control functions.
- 683 HEALTH SERVICES SYSTEMS MANAGEMENT** 3 credits  
Prerequisite: 580 or 600 or equivalent or permission of instructor. Study of health services organizations, comparative delivery systems, the roles of third-party payors and government policy in health care. Seminar format: major research paper required.
- 686 HEALTH SERVICES RESEARCH PROJECT** 3 credits  
Prerequisites: 683 or permission of instructor. In-depth field study in health services administration with applications of research and analysis skills. Course requires review of literature and a major research paper.
- 687 GRADUATE SEMINAR IN HEALTH SERVICES POLICY AND ADMINISTRATION** 3 credits  
Prerequisites: 683 or permission of instructor. Advanced seminar; in-depth study of contemporary issues in health services policy and administration. Includes examination of macro-social and micro-organizational issues. Major paper required.
- 688 INDEPENDENT STUDY IN HEALTH SERVICES ADMINISTRATION** 1-3 credits  
(May not be repeated for more than three credits) Prerequisites: 580 or 600 or equivalent or permission of instructor. Independent study and research of a special topic of interest in health services administration (e.g., management), chosen by the student in consultation with and under the supervision of the instructor.
- 690 SELECTED TOPICS IN MANAGEMENT** 3 credits  
(May be repeated for a total of six credits) Prerequisite: 652. Selected topics in historical, contemporary and/or operational and functional areas of management.
- 695 BUSINESS STRATEGY AND POLICY: DOMESTIC AND INTERNATIONAL** 3 credits  
Prerequisite: to be final course in M.B.A. program. A case-oriented course which focuses on integration of theoretical and practical knowledge acquired in core business courses. Students analyze, evaluate, formulate organization objectives and strategies within domestic and international environmental contexts.
- 697 INDEPENDENT STUDY IN MANAGEMENT** 1-3 credits  
(May be repeated for a total of six credits) Focus on special topics of study and research in management on an independent basis.

## MARKETING

### 6600:

- 540 PRODUCT PLANNING** 3 credits  
Prerequisite: 600. Examines the creation of new products and the management of existing products through the life cycle. (Graduate credit requires additional research paper.)
- 550 STRATEGIC RETAIL MANAGEMENT** 3 credits  
Prerequisite: 600 or permission of instructor. Investigation of strategic and tactical retail decisions and issues through the use of case analysis, computer applications, experiential games, and field projects. (Graduate credit requires additional research paper.)
- 570 BUSINESS TO BUSINESS MARKETING** 3 credits  
Prerequisite: 600 or permission of instructor. Studies industrial and organizational buyer behavior. The strategic marketing management practices of firms selling to business organizations, government agencies, and institutions are also examined. (Graduate credit requires additional research paper.)
- 575 BUSINESS NEGOTIATIONS** 3 credits  
Examines business negotiation principles and practices, and builds skills in the process of negotiating business agreements.
- 580 SALES MANAGEMENT** 3 credits  
Prerequisite: 600 or permission of instructor. Develops analytical and managerial skills through case studies and other learning activities relating to the organization, selection, training motivation, and control of a sales force. (Graduate credit requires additional research paper.)
- 600 MARKETING CONCEPTS** 3 credits  
Introductory course examining buyer behavior, environmental influences, target marketing, product development, distribution, promotion, and pricing for business firms and nonprofit organizations within a global context.
- 620 STRATEGIC MARKETING MANAGEMENT** 3 credits  
Prerequisite: 600 or equivalent. Managerial assessments of opportunities, threats are explored as are the development and management of appropriate strategic marketing plans and their tactical implementation.
- 630 MARKETING OF SERVICES** 3 credits  
Prerequisite: 600 or permission of instructor. Examines marketing strategies within the service industry. Focuses on both profit (e.g., transportation, financial) and nonprofit (e.g., educational, social) organizations. Product support services are also covered.
- 640 BUSINESS RESEARCH METHODS** 3 credits  
Prerequisites: 6500/601 and 602. Covers the scientific methods as well as the gathering and analysis of information to identify opportunities and solve problems within a business organization.

- 650 CONSUMER BEHAVIOR** 3 credits  
Prerequisite: 600. Examines the marketplace behavior of individuals, households and organizations. Focus is placed on integrating theoretical models with managerial applications.
- 655 MARKETING COMMUNICATIONS** 3 credits  
Prerequisite: 600. The total range of marketing communication tools are examined individually and in the context of planning, developing, and implementing a systematic and integrated communications program.
- 670 COMPETITIVE BUSINESS STRATEGY** 3 credits  
Prerequisites: 600/601, 6400/602, 6500/600, and 6600/600. Investigation of competitive business strategy from an industry perspective. The course presents a framework which can be used to understand and develop competitive strategies.
- 680 APPLICATIONS OF MARKETING THEORY** 3 credits  
Prerequisite: 600. Examines marketing theories and their applications to business problem-solving and decision-making. Selected readings and field projects are used to enhance the student's managerial skills.
- 697 INDEPENDENT STUDY IN MARKETING** 1-3 credits  
(May be repeated for a total of six credits) Focus on special topics of study and research in marketing on an independent basis.

## PROFESSIONAL

### 6700:

- 690 PROFESSIONAL RESPONSIBILITY** 1 credit  
Prerequisite: Nine graduate credits. Seminar on the professional responsibilities of business men and women to make them and the business organization in which they work more responsible decision makers.
- 692 INTERNATIONAL BUSINESS** 1 credit  
Prerequisite: Nine graduate credits. Enhances understanding of global business issues, present relevant trends and updates, facilitates cross-cultural interaction, and explores applied practices of international business.
- 694 APPLIED BUSINESS DOCUMENTATION AND CONTACT** 1 credit  
This course is designed to offer a practicum approach to the skills and strategies for handling specialized documents, contact protocols, and business presentations.
- 695 INTERNSHIP IN BUSINESS** 1-3 credits  
Prerequisite: permission of instructor. On-the-job experience with cooperating private and public sector organizations. Individual assignments made by supervising faculty member. Periodic reports and research papers required. Credit/Noncredit.
- 696 SPECIAL TOPICS IN PROFESSIONAL DEVELOPMENT** 1 credit  
Special topics and current issues in the MBA Program, Professional Core. May be repeated with a change of subject, not to exceed 4 credits.
- 698 COLLOQUIUM IN BUSINESS** 1-3 credits  
Prerequisite: permission of graduate director. Study of business administration through a seminar of several lectures in business research and practice. A broad range of topics in business research and issues will be discussed by guests, faculty and graduate students. May be repeated, but will not satisfy degree requirements (Credit/non-credit.)

## INTERNATIONAL BUSINESS

### 6800:

- 605 INTERNATIONAL BUSINESS ENVIRONMENTS** 3 credits  
An introductory course designed to develop a broad understanding of global business environments.
- 630 INTERNATIONAL MARKETING POLICIES** 3 credits  
Prerequisite: 6600/620 and 6800/605 or permission of instructor. Explores the problems of formulating and implementing marketing strategies and tactics within complex and changing multinational organizations and international markets. A planning framework is emphasized.
- 685 MULTINATIONAL CORPORATIONS** 3 credits  
Prerequisite: 605. An advanced course designed to develop an in-depth understanding of global businesses, their functions, structures, and strategic operations.
- 690 SEMINAR IN INTERNATIONAL BUSINESS** 3 credits  
Prerequisite: 605 and a total of 15 Phase II graduate credits or permission of instructor. Advanced course covering several major issues in international business.
- 697 INDEPENDENT STUDY IN INTERNATIONAL BUSINESS** 1-3 credits  
(May be repeated for a total of six credits) Prerequisites: Graduate standing and permission of instructor. Focus on special topics of study and research in international business on an independent basis.

# College of Fine and Applied Arts

## ART

### 7100:

- 500 ART IN THE UNITED STATES BEFORE WORLD WAR II** 3 credits  
Prerequisite: 101 or permission of instructor. Consideration of development of art in the United States from earliest evidences to approximately World War II.
- 501 SPECIAL TOPICS IN HISTORY OF ART** 1-3 credits  
Prerequisite: 201 or permission. A lecture course focusing on a particular movement, period, artist, or medium. (May be repeated when a different subject or level of investigation is selected.)
- 505 HISTORY OF ART SYMPOSIUM** 1-3 credits  
(May be repeated for credit when a different subject is indicated) Prerequisite: one art history course beyond 201 or permission of instructor. Lecture, individual research and evaluation, group discussion related to a specific time period or to an artistic problem
- 590 WORKSHOP IN ART** 1-4 credits  
(May be repeated for credit when a different subject or level of investigation is indicated - 490 to maximum of eight credits; 590 to maximum of 12 credits) Prerequisite: advanced standing in art or permission of instructor. Group investigation of a particular phase of art not offered by other courses in curriculum.
- 591 ARCHITECTURAL PRESENTATIONS I** 3 credits  
Prerequisites: Junior level or permission. Studio practice in architectural design and presentation methods in residential and commercial interiors.
- 592 ARCHITECTURAL PRESENTATIONS II** 3 credits  
Prerequisites: 491/591. Continuation of concepts covered in Architectural Presentations I with additional work in color rendering techniques. Emphasis on a variety of rendering mediums.
- 597 INDEPENDENT STUDIES** 1-3 credits  
(May be repeated) Prerequisites for art majors: advanced standing in area chosen and permission of instructor. Prerequisite for non-art majors: permission of instructor. Investigation in depth of aesthetic and technical problems within a studio-selected area of specialization. Student must present in writing a proposed study plan and time schedule for instructor approval.
- 598 SPECIAL PROBLEMS IN HISTORY OF ART** 1-3 credits  
(May be repeated for credit when a different subject or level of investigation is indicated) Prerequisites: 14 credits in art history and permission of instructor. Individual research in art history centered around limited topic, such as specific time period, history of specific techniques, a single artist or movement in art history. No more than 10 credits will be counted toward major.

## HOME ECONOMICS AND FAMILY ECOLOGY

### 7400:

- 501 FAMILY-LIFE PATTERNS IN THE ECONOMICALLY DEPRIVED HOME** 2 credits  
Study of family life orientation and life-style patterns among economically deprived with emphasis on impact or socioeconomic and psychological deprivation on family members throughout family life span.
- 503 ADVANCED FOOD PREPARATION** 3 credits  
Prerequisite: 141 or 245 or permission of instructor. Study of advanced techniques of food preparation. Introduction to and interpretation of classic and foreign cuisines. Emphasis on individualized experience, skill development and evaluation of procedures and results.
- 504 ADOLESCENCE IN THE FAMILY CONTEXT** 3 credits  
Prerequisites: 201, 265 or permission of instructor. The influences of adolescent behavior on the family and the influence of the family environment on adolescent development.
- 506 FAMILY FINANCIAL MANAGEMENT** 3 credits  
Analysis of the family as a financial unit including financial problems and their resolution, decision-making patterns and financial practices behavior. Cases, exercises, problems and computer analysis.
- 518 HISTORY OF INTERIOR DESIGN I** 4 credits  
The study of furnishings, interiors, and architecture from antiquity through the eighteenth century, with emphasis on the socio-cultural influences shaping their development.
- 519 HISTORY OF INTERIOR DESIGN II** 4 credits  
The study of nineteenth and twentieth-century furnishings and interiors, with emphasis on the social-cultural influences shaping their development.
- 520 EXPERIMENTAL FOODS** 3 credits  
Prerequisites: 246 and 3150:130. Theory and methods used in the experimental study of foods. Analytical procedures in sensory and instrumental evaluation of food quality. Individual research emphasized. Lecture/Laboratory.
- 523 PROFESSIONAL IMAGE ANALYSIS** 3 credits  
Prerequisites: Senior status. Comparison of theories associated with projecting and maximizing an appropriate professional image consistent with career goals and objectives.
- 524 NUTRITION IN THE LIFE CYCLE** 3 credits  
Prerequisite: 316. Study of the physiological basis for nutritional requirements; interrelating factors which affect growth, development, maturation and nutritional status from conception through the elderly years.
- 525 ADVANCED TEXTILES** 3 credits  
Prerequisite: 121. Evaluation of physical, aesthetic, comfort, care and durability properties of textile products and testing procedures to determine suitability for desired end uses.
- 527 TEXTILE AND APPAREL INDUSTRIES** 3 credits  
Prerequisite: 293. Examines the global structure and scope of the textile and apparel industries emphasizing an economic perspective.

- 532 INTERIOR TEXTILES AND PRODUCT ANALYSIS** 3 credits  
Prerequisite: 158. Examination, evaluation, and analysis of products for interiors with emphasis on trade classifications, selection criteria, economic factors, and legislative concerns.
- 533 RESIDENTIAL DESIGN** 3 credits  
Prerequisites: 158, 258, 333, 334, 7100:491. A comprehensive study of residential design with emphasis on conceptual, analytical, and graphic skills.
- 534 COMMERCIAL DESIGN** 3 credits  
Prerequisites: 158, 258, 333, 334; 7100:491. A comprehensive study of non-residential design with emphasis on conceptual, analytical, and graphic skills.
- 535 PRINCIPLES AND PRACTICES OF INTERIOR DESIGN** 3 credits  
Prerequisite: 158 and 433 or 434. Study of the business aspect of interior design; business procedures, manufacturing of home furnishings and principles and psychology of marketing home furnishings.
- 536 TEXTILE CONSERVATION** 3 credits  
Prerequisites: 121, 123, 317. Principles and practices of textile conservation with emphasis on procedures appropriate for collectors and small historical agencies.
- 537 HISTORIC COSTUME TO 1800** 3 credits  
Study of costume and textiles from antiquity through the eighteenth century, with emphasis on social-cultural influences.
- 538 HISTORY OF FASHION SINCE 1780** 3 credits  
Prerequisite: 317. Study of nineteenth and twentieth-century western fashions, textiles, and designers with emphasis on social-cultural influences.
- 540 FAMILY CRISIS** 3 credits  
Study of family stress and crisis including internal and external variables and their influence on degree of disorganization, coping and recovery. Includes theory, research and application dimensions.
- 542 HUMAN SEXUALITY** 3 credits  
Prerequisite: 201 or permission of instructor. Introduction to problems and values. Emphasis is on the role of values in intimate relationships, the diverse dimensions of sexual responsibility.
- 545 PUBLIC POLICY AND AMERICAN FAMILIES** 3 credits  
How legislation in such areas as housing, clothing, consumer affairs, family formation and dissolution, resource conservation, child development and health care affects and, in some cases, determines the nature, structure and quality of the family as a social institution.
- 546 CULTURE, ETHNICITY AND THE FAMILY** 3 credits  
Study of the role of culture and ethnicity in adaptation of the family system to environment. Program applications considered.
- 548 BEFORE AND AFTER SCHOOL CHILD CARE** 3 credits  
Study of the development, implementation and evaluation of school-age child-care programs for before and after school and vacation periods.
- 549 FLAT PATTERN DESIGN** 3 credits  
Prerequisite: 123 or equivalent. Theory and experience in clothing design using flat pattern techniques.
- 551 CHILD IN THE HOSPITAL** 4 credits  
Prerequisite: 265, comparable course or permission of instructor. Seminar dealing with special needs and problems of hospitalized/ill child and family. Literature related to effects, separation, illness and stress. Examination of strategies for coping.
- 555 PRACTICUM: ESTABLISHING AND SUPERVISING A CHILD-LIFE PROGRAM** 3 credits  
Prerequisite: 451/551. Explores procedures for implementing and setting up child-life programs; critical analysis of currently functioning program.
- 560 ORGANIZATION AND SUPERVISION OF CHILD-CARE CENTERS** 3 credits  
Theory, principles and procedures involved in establishing and operating centers for infants, toddlers, preschool and school-age children.
- 561 CASE MANAGEMENT FOR CHILDREN AND FAMILIES I** 3 credits  
Provides an overview of Case Management basics in a multi-systems collaborative context. Includes roles, values, principles, state and service systems, and service coordination.
- 562 CASE MANAGEMENT FOR CHILDREN AND FAMILIES II** 3 credits  
Prerequisite: 461/561. Provides in-depth exploration of Case Management principles and practice. Emphasis on process and functions, assessment, cross-system service planning and coordination, advocacy, and cultural diversity.
- 563 PRACTICUM IN CROSS-SYSTEMS CASE MANAGEMENT FOR CHILDREN AND FAMILIES** 3 credits  
Prerequisites: 461/561, 462/562, and six hours of electives. Provides on-site opportunities to apply skills in cross-systems collaborative Case Management with children and families. Includes review of strategies, ethics, and survival skills, and supervision.
- 570 THE FOOD INDUSTRY: ANALYSIS AND FIELD STUDY** 3 credits  
Prerequisite: 245 or permission. Role of technology in extending the food supply. Chemical, physical and biological effects of processing and storage, on-site tours of processing plants.
- 574 CULTURAL DIMENSIONS OF FOOD** 3 credits  
An examination of cultural, geographical and historical influences on development of food habits. Emphasis on evolution of diets, effects of religion, education, gender roles, media.
- 575 ANALYSIS OF FOOD** 3 credits  
Prerequisite: 3150:130. General chemistry or equivalent. Comprehensive course in the theory and practice of food analysis by classical and modern chemical and instrumental methods. Principles emphasized by experimentation and demonstration.
- 576 DEVELOPMENTS IN FOOD SCIENCE** 3 credits  
Prerequisite: 246. Advanced study of the chemistry and physics of food components, affecting characteristics of foods. Critical evaluation of current basic and applied research emphasized.
- 580 COMMUNITY NUTRITION I-LECTURE** 3 credits  
Corequisite: 481 for CP student only. Socio-cultural aspects of community assessment, program implementation and evaluation, and rationales for nutrition services.
- 581 COMMUNITY NUTRITION I-CLINICAL** 1 credit (credit/noncredit)  
Prerequisite: CP Students only 428. Corequisite: 480/580. Field placement in area agencies offering nutrition services. Study of the agency's goals, organization, and philosophy of nutritional care.
- 582 COMMUNITY NUTRITION II-LECTURE** 3 credits  
Prerequisites: 480/580 (481/581 for CP student only). Corequisite: 483/583 for CP student only. This course will focus on managing nutrition services for productivity (economic, community and labor resources, and evaluation), and educating the dietitians' "various publics" about nutrition.
- 583 COMMUNITY NUTRITION II-CLINICAL** 1 credit (credit/noncredit)  
Prerequisite: (CP students only) 481/581. Corequisite: 482/582. Field placement in area agencies offering nutrition services. Study of the agency's goals, organization, and philosophy of nutritional care.

- 584 ORIENTATION TO THE HOSPITAL SETTING** 2 credits  
Prerequisite: 265, comparable course or permission of instructor. Focuses on hospital as a major social institution; introduces procedures and functions of the hospital; roles played by various hospital personnel plus cursory knowledge of medical terminology, common childhood diseases, illnesses and injuries.
- 585 SEMINAR IN HOME ECONOMICS** 1-3 credits  
Prerequisite: permission of instructor. Exploration and evaluation of current developments in selected areas.
- 587 SPORTS NUTRITION** 3 credits  
Prerequisites: 133; 3100:207; 3150:130 or 203 or permission of instructor. In-depth study of energy metabolism and utilization before, during, and after exercise. Factors affecting nutrient needs and peak performance of different athletic populations are emphasized.
- 588 PRACTICUM IN DIETETICS** 1-3 credits  
Prerequisite: approval of advisor/instructor. Practical experience in application of the principals of nutrition.
- 589 PROFESSIONAL PREPARATION FOR DIETETICS** 1 credit  
Prerequisite: open to those dietetics students in the Didactic Program or Graduate program who plan to apply for a Dietetic Internship. Historical aspects of dietetics and where the profession is going. Specialty areas of dietetic practice are explored. Students prepare the application for dietetic internship.
- 590 WORKSHOP IN HOME ECONOMICS AND FAMILY ECOLOGY** 1-3 credits  
Prerequisite: at least junior standing. Investigation on current issue or topic in selected areas of home economics and family ecology. May be on off-campus study tour or an on-campus full-time group meeting.
- 591,2,3 WORKSHOP IN HOME ECONOMICS AND FAMILY ECOLOGY** 1,2,3 credits  
Prerequisite: Junior standing. Current issues and topics in selected areas of home economics and family ecology. On/off campus of combined.
- 594 PRACTICUM IN PARENT AND FAMILY EDUCATION** 3 credits  
Prerequisites: 596, 605. Provides on-site opportunities to apply parent and family education skills. Includes a review of strategies, ethical considerations, and supervision by the on-site director.
- 596 PARENT EDUCATION** 3 credits  
Prerequisite: 265, comparable course, or permission. Practical application that reviews and analyzes various parenting techniques with major emphasis on the evaluation of parent education programs.
- 601 FAMILY IN TRANSITION** 2 credits  
Overview of family in historical perspective. Effects of social change upon family and emerging relational patterns. Review of theory, research and educational strategies.
- 602 FAMILY IN LIFE-SPAN PERSPECTIVE** 3 credits  
Study of individual and family development across life span. Emphasis on adjustment patterns and interpersonal competence. Implications for education theory research and social policy.
- 603 FAMILY RELATIONSHIPS IN MIDDLE AND LATER YEARS** 3 credits  
Study of family patterns and problems during middle and later years of life with emphasis on psychological and biological changes and economic and social adequacy. Research and trends in gerontology.
- 604 ORIENTATION TO GRADUATE STUDIES IN HOME ECONOMICS AND FAMILY ECOLOGY** 1 credit  
Introduction to the concepts and processes necessary for graduate study in the interdisciplinary field of Home Economics and Family Ecology.
- 605 DEVELOPMENTAL PARENT-CHILD INTERACTIONS** 3 credits  
Prerequisite: 265 or equivalent or permission. Study of reciprocal interactions formed between parent and child from birth to adulthood. Consideration of cross-cultural studies, historical and societal influences and varying family characteristics and structures.
- 607 FAMILY DYNAMICS** 3 credits  
Development of techniques in home economics programs utilizing role theory, exchange theory and systems theory as understood through the study of the family across the life cycle.
- 610 CHILD DEVELOPMENT THEORIES** 3 credits  
A comparative study of developmental theories of the child within the family context. Application of the theories to child rearing in the family will be emphasized.
- 616 INFANT AND CHILD NUTRITION** 2 credits  
Emphasizes current research trends in physiology of infant and young child in relation to nutritional requirements and feeding practices.
- 624 ADVANCED HUMAN NUTRITION I** 3 credits  
Prerequisites: undergraduate or graduate-level courses in nutrition and biochemistry. In-depth study of human nutrition emphasizing metabolism physiological functions, and interrelationships of carbohydrate, protein and lipids and the determinants of human energy requirements.
- 625 ADVANCED HUMAN NUTRITION II** 3 credits  
Prerequisite: 624 or equivalent in-depth study of human nutrition with and emphasis in the utilization, physiological functions and interrelationships of vitamins and minerals.
- 631 PROBLEMS IN DESIGN** 1-3 credits  
(May be repeated, but no more than 6 credits will apply to M. A.) Prerequisite: written proposal approved by faculty adviser. Individual solution of a specific design problem within the student's area of clothing, textiles and interior specialization.
- 632 ADVANCED FOOD THEORY AND APPLICATIONS** 3 credits  
Prerequisite: 420/520 or permission. Advanced study of the chemistry and physics of food components, attesting the characteristics of foods. critical evaluation of current basic and applied research emphasized.
- 634 MATERIAL CULTURE STUDIES** 3 credits  
Methods of studying clothing, textiles, and interiors from a cultural and historical perspective.
- 639 THEORIES OF FASHION** 3 credits  
In-depth analysis of the theories underlying fashion and evaluation of current research related to the study of fashion.
- 640 NUTRITION IN DIMINISHED HEALTH** 3 credits  
Prerequisite: 428 or permission. An examination of concepts related to nutritional intervention associated with selected pathophysiological and debilitating conditions throughout the life cycle. Emphasis on current literature.
- 651 FAMILY AND CONSUMER LAW** 3 credits  
Study of laws which control and protect individuals within family. Emphasis on current trends, legal rulings. Course taught by attorney.
- 652 PROFESSIONAL PRESENTATION IN HOME ECONOMICS** 3 credits  
Developing effective home economics professional presentations. Emphasis on visuals, display, demonstrations, public relations materials, user manuals, conference management, portfolio development, and learning styles.

- 660 PROGRAMMING FOR CHILD-CARE CENTERS** 3 credits  
Principles, procedures involved in program development for child-care centers. Examination of current programs available for preschool children. Implications, literary analysis, application, evaluation stressed.
- 665 DEVELOPMENT IN INFANCY AND EARLY CHILDHOOD** 3 credits  
Analysis of research and theoretical frameworks regarding infant and child development from conception through age five. Implications for guidance and education.
- 677 SOCIAL PSYCHOLOGY OF DRESS AND THE NEAR ENVIRONMENT** 3 credits  
Study of dress and the near environment as they relate to human behavior at the micro and macro level.
- 680 HISTORICAL AND CONCEPTUAL BASES OF HOME ECONOMICS AND FAMILY ECOLOGY** 3 credits  
History of the field of home economics and family ecology with emphasis on the leaders and the conceptual basis of the field.
- 685 RESEARCH METHODS IN HOME ECONOMICS AND FAMILY ECOLOGY** 3 credits  
A study of home economics and family ecology research methods emphasizing concept and theory development, policy application and ethical considerations.
- 688 PRACTICUM IN HOME ECONOMICS AND FAMILY ECOLOGY** 3 credits  
Prerequisite: permission of advisor/instructor. A minimum of 150 hours of supervised experience in an approved community setting to acquire skills related to area of specialization.
- 690 THESIS RESEARCH/READING** 3 credits  
Prerequisite: permission of thesis adviser. Supervised reading and research related to approved thesis topic. May be repeated once.
- 694 MASTER'S PROJECT** 5 credits  
Prerequisite: permission of adviser. The development, implementation and evaluation of a community-based supervised project which makes a significant contribution to the field and may lead to publication.
- 695 CHILD LIFE INTERNSHIP** 5 credits  
Prerequisite: permission of adviser. A minimum of 480 hours of supervised practical experience in an approved medical setting.
- 696 INDIVIDUAL INVESTIGATION IN HOME ECONOMICS AND FAMILY ECOLOGY** 1-3 credits  
Prerequisite: permission of adviser. Individual investigation and analysis of a specific topic in student's area of specialization of interest under direction of a faculty adviser.
- 697 INDIVIDUAL INVESTIGATION IN FAMILY DEVELOPMENT** 1-3 credits  
Prerequisite: permission of graduate adviser only. Individual pursuit and analysis in specific area of student's interest and design under direction of faculty adviser.
- 698 INDIVIDUAL INVESTIGATION OF CHILD DEVELOPMENT** 1-3 credits  
Prerequisite: permission of graduate adviser only. Individual pursuit and analysis in specific area of student's interest and design under direction of faculty adviser.
- 699 MASTER'S THESIS** 5 credits  
Prerequisite: permission of adviser. Supervised research in a specialized area of home economics and family ecology which makes a contribution to the field and may lead to publication.

## MUSIC 7500:

- 526 GRADUATE MUSIC THEORY REVIEW** 2 credits  
Prerequisite: Undergraduate music theory equivalent to four semesters. Review of basic music a theory concepts. Coverage includes the chromatic harmony vocabulary of the 18th, 19th, and 20th centuries.
- 527 GRADUATE MUSIC HISTORY REVIEW** 2 credits  
Prerequisite: Undergraduate music history equivalent to four semesters of music history or literature study; review of basic music history for graduate students. Coverage extends from antiquity to the present. Both reading and listening assignments will be required.
- 532 TEACHING AND LITERATURE: PERCUSSION INSTRUMENTS** 2 credits  
To train undergraduate and graduate percussion students in techniques of percussion education. Emphasis on research, literature, performance, and techniques from elementary through secondary levels.
- 551 INTRODUCTION TO MUSICOLOGY** 2 credits  
Prerequisite: 352. Comparative musicology, acoustics; psychology and physiology of music; aesthetics; theory of music theory; historical musicology.
- 553 MUSIC SOFTWARE SURVEY AND USE** 2 credits  
Prerequisite: 152 or permission of instructor. A survey and evaluation of available software in the various forms of musical instruction. Students will design a course suitable for submission to a programmer.
- 555 ADVANCED CONDUCTING: INSTRUMENTAL** 2 credits (30 clinical hours)  
Baton techniques and problems relating to practice, reading and preparation of scores; organization of ensembles; programming; conducting large instrumental ensembles. One hour lab required.
- 556 ADVANCED CONDUCTION: CHORAL** 2 credits  
Prerequisite: 361 or equivalent. Conduction techniques to the choral ensemble, including leadership, error detection, tonal development, stylistic accuracy and analysis. One hour lab required.
- 562 REPERTOIRE AND PEDAGOGY: ORGAN** 3 credits  
Prerequisite: permission of instructor. Survey of organ literature of all eras and styles, and of methods of teaching organ, applying principles to literature.
- 563 REPERTOIRE AND PEDAGOGY: STRING INSTRUMENTS** 3 credits  
Prerequisite: permission of instructor. Study in depth of the four bowed string instruments, their teaching and close relationship. Despite obvious difference in physical application of cello and bass from violin and viola, methods of bowing, sound production and coloring are closely related. Application of the instruments to solo, chamber and orchestral playing.
- 567 GUITAR PEDAGOGY** 2 credits  
Prerequisite: permission of instructor. A systematic analysis of prevailing schools of guitar pedagogy sound production psychology, method books and special problems in teaching addressed.
- 568 GUITAR ARRANGING** 2 credits  
Prerequisite: permission of instructor. After comparative analyses of selected examples, student make original solo guitar arrangements of works written for other solo instruments ensembles.

- 569 HISTORY AND LITERATURE OF THE GUITAR AND LUTE** 2 credits  
Prerequisite: permission of instructor. Study of plucked, fretted, string instruments from the 14th Century to the present; construction, notation, literature and performance practices. Modern editions and recordings evaluated.
- 590 WORKSHOP IN MUSIC** 1-3 credits  
Prerequisite: permission of instructor. Investigation of topics not offered in regular curriculum. Graduate student must fulfill additional requirements.
- 601 CHORAL LITERATURE** 2 credits  
Prerequisite: permission of instructor. Study in depth of style, structure, technical demands, manner of setting text, and special performance problems found in masterworks by great choral composers of nine centuries.
- 604 DEVELOPMENT OF OPERA** 2 credits  
Prerequisite: permission of instructor. Growth and development of opera from 1600 to present. Includes detailed examination of stylistic and structural changes as well as performance practices.
- 608 SEMINAR IN MUSIC OF THE WESTERN HEMISPHERE** 2 credits  
Prerequisite: permission of instructor. Designed to develop understanding of peoples and cultures of Western Hemisphere through study of music of each major area. Research and writing in areas of special interest.
- 609 PEDAGOGY OF JAZZ IMPROVISATION** 3 credits  
A detailed study of the methods and materials as they relate to the teaching of jazz improvisation.
- 611 FOUNDATIONS AND PRINCIPLES OF MUSIC EDUCATION** 3 credits  
Prerequisite: permission of instructor. Study of basic philosophical, historical, sociological and psychology concepts among which public school music programs function.
- 612 PRACTICES AND TRENDS IN MUSIC EDUCATION** 3 credits  
Prerequisite: permission of instructor. In-depth exploration of innovative practices and trends in music education. Findings of research and practice related to prevailing situations in public/private school programs.
- 613 INSTRUCTIONAL PROGRAMMING IN MUSIC FOR THE MICROCOMPUTER** 3 credits  
Prerequisite: 453/553/ Introduction to programming languages for the microcomputer including BASIC, Pascal and Assembler. Programming will be directed towards music educational concepts.
- 614 MEASUREMENT AND EVALUATION IN MUSIC** 3 credits  
Prerequisite: permission of instructor. Study and application of principles of music aptitude, music achievement and content evaluation, and research as a function of evaluation.
- 615 MUSICAL STYLES AND ANALYSIS I** 2 credits  
Prerequisite: permission of instructor. Detailed study of compositional techniques and stylistic traits observed in Western music from period of Gregorian chant through music of Palestrina and Gesualdo and others of late Renaissance.
- 616 MUSICAL STYLES AND ANALYSIS II** 2 credits  
Prerequisite: permission of instructor. Detailed study of compositional techniques and stylistic traits observed in Western music from Monteverdi through early Beethoven.
- 617 MUSICAL STYLES AND ANALYSIS III** 2 credits  
Prerequisite: permission of instructor. Detailed study of compositional techniques and stylistic traits observed in Western music from period of late Beethoven through Mahler and Strauss.
- 618 MUSICAL STYLES AND ANALYSIS IV** 2 credits  
Prerequisite: permission of instructor. Detailed study of compositional techniques and stylistic traits observed in Western music in 20th Century.
- 619 THEORY AND PEDAGOGY** 2 credits  
Prerequisite: permission of instructor. Methodology of theory teaching in 20th Century. Focus on differing philosophies of approach to theory instruction as noted from tests on subject. Recent innovations and techniques of teaching, such as programmed material, computer-assisted instruction studied.
- 620 COMPUTER ANALYSIS IN MUSIC** 2 credits  
Prerequisite: a minimum of one course in the 615-618 series. A systematic study of analytic techniques in music which make use of the computer. Hands-on experiences with music encoding, card manipulation, interactive, systems and program writing as related to music analysis.
- 621 MUSIC HISTORY SURVEY: MIDDLE AGES AND RENAISSANCE** 2 credits  
Prerequisite: permission of instructor. Historical and stylistic analysis of all aspects of music of Middle Ages and Renaissance. Research and writing in areas of special interest.
- 622 MUSIC HISTORY SURVEY: BAROQUE** 2 credits  
Prerequisite: permission of instructor. Historical and stylistic analysis of Baroque music; study in depth of specific examples, from recordings, scores and live performances; continuation and synthesis of approaches normal to study of music history; selected readings related to each student's particular fields of interest; project papers.
- 623 MUSIC HISTORY SURVEY: CLASSIC AND ROMANTIC** 2 credits  
Prerequisite: permission of instructor. Historical and stylistic analysis of classic and romantic music; study in depth of specific examples, through recordings, scores and live performances; discontinuation and synthesis of approaches normal to study of music history; selected readings related to each student's particular fields of interest; project papers.
- 624 MUSIC HISTORY SURVEY: 20TH CENTURY** 2 credits  
Prerequisite: permission of instructor. Historical and stylistic analysis of 20th Century music; study in depth of specific examples from scores, recordings and live performances; continuation and synthesis of approaches normal to study of music history; selected readings and project papers.
- 625 GRADUATE BIBLIOGRAPHY AND RESEARCH IN MUSIC** 2 credits  
Prerequisite: undergraduate music degree of equivalent. Examination of all types of published music materials; research methods for thesis preparation and professional publishing; field trips to music libraries, computerized music research.
- 626 MUSIC TYPOGRAPHY** 3 credits  
Prerequisite: 553 or appropriate computer skills. The art of music notation as related to computer typesetting. Emphasis on musical examples of a variety of types and problem solving using computer techniques.
- 627 COMPUTER STUDIO DESIGN** 2 credits  
The design and maintenance of a computer lab. Emphasis on hardware and software setup to maximize function and minimize maintenance.
- 630 TEACHING AND LITERATURE: BRASS INSTRUMENTS** 2 credits  
Prerequisite: permission of instructor. Research in current trends and issues in brass teaching techniques and appropriate literature.
- 631 TEACHING AND LITERATURE: WOODWIND INSTRUMENTS** 2 credits  
Prerequisite: permission of instructor. To delineate and clarify contemporary techniques of woodwind pedagogy and to develop a comprehensive understanding of woodwind literature.
- 633 TEACHING AND LITERATURE: PIANO AND HARPSICHORD** 2 credits  
Prerequisite: permission of instructor. The examination of piano and harpsichord literature in historically chronological order with special attention to its pedagogical value and stylistic differences.
- 634 TEACHING AND LITERATURE: STRING INSTRUMENTS** 2 credits  
Prerequisite: permission of instructor. Research in current trends and issues in string teaching techniques and appropriate literature.
- 640,1,2,3 ADVANCED ACCOMPANYING I, II, III, IV** 1 credit each  
Prerequisite: Graduate standing in keyboard performance and/or accompanying or the permission of the instructor. An in-depth study of principles of accompanying, sight reading, standard repertoire, and transposition.
- 647 MASTER'S CHAMBER RECITAL** 1 credit  
Prerequisite: permission of instructor. Composition student will present a recital of chamber music compositions (at least one-half hour in length) written while in residence at the University. Student will actively organize and coordinate the recital and will also participate either as performer or conductor.
- 653 ELECTRONIC MUSIC** 3 credits  
The theory and practice of electronic music composition. Developing a practical understanding of sound synthesis and MIDI in a digital/analog multi-track recording studio.
- 657 STUDENT RECITAL** 0 credits  
Required of all music majors. Forum for student and faculty providing lectures, recitals, and opportunity to practice skills for successful music performance.
- 665 VOCAL PEDAGOGY** 3 credits  
Prerequisite: permission of instructor. In-depth study of subjects dealing with teaching of voice: physiology of vocal instrument, principles governing vocal production and application of vocal pedagogy.
- 666 ADVANCED SONG LITERATURE** 3 credits  
Prerequisite: permission of instructor. Systematic study of song literature presented chronologically according to national schools of composition. Stylistic compositional characteristics and representative works of all major composers of solo song literature.
- 675 SEMINAR IN MUSIC EDUCATION** 1-3 credits  
(May be repeated for a total of 6 credits) Intensive examination of special topics in the field of music education.
- 697 ADVANCED PROBLEMS IN MUSIC** 1-3 credits  
(May be repeated for a total of eight credits) Prerequisite: permission of graduate adviser. Studies or research projects related to problems in music.
- 698 GRADUATE RECITAL** 2 credits  
Prerequisite: permission of graduate adviser. Recital prepared and presented as a requirement for any appropriate degree option. If recital document is to be written in conjunction with the recital, add 699 for the additional credit.
- 699 MASTER'S THESIS** 4-6 credits  
Prerequisite: permission of graduate adviser. Research related to the completion of the master's thesis or recital document written in conjunction with the graduate recital, depending on the student's degree option.

## MUSICAL ORGANIZATIONS

### 7510:

- 521 GUITAR CHAMBER MUSIC** 1 credit  
Prerequisite: Open to all upper class instrumentalists and vocalists. Guitarists must have taken Guitar Ensemble, 7510:116. Study, coaching, and performance of major works for guitar with other instruments or voice. Major conducted ensemble for guitar majors.
- 602 AKRON SYMPHONY CHORUS** 1 credit  
Open to University and community members by audition. Prospective members should contact School of Music two weeks before semester begins. Performs with Akron Symphony Orchestra.
- 603 UNIVERSITY SYMPHONY ORCHESTRA** 1 credit  
Membership by audition. Organization devoted to study of orchestral literature. Full-length concerts as well as special University appearances. Major conducted ensemble.
- 604 SYMPHONIC BAND** 1 credit  
Membership by audition. The University Symphonic Band is the most select band at the University and performs the most demanding and challenging music available.
- 605 VOCAL CHAMBER ENSEMBLE** 1 credit  
Membership open to those enrolled in applied voice study. Coaching and rehearsal of solo and ensemble literature for voices from operatic, oratorio and lieder repertoires.
- 606 BRASS ENSEMBLE** 1 credit  
Membership by audition. Study and performance of literature for brass ensemble from all periods of music history. Frequent public concerts. For advanced brass players.
- 607 STRING ENSEMBLE** 1 credit  
Membership by audition. In-depth study and performance of chamber music literature with special emphasis on string quartet and piano trio.
- 608 OPERA WORKSHOP** 1 credit  
Membership by audition. Musical and dramatic group study of excerpts from operatic repertoire. Includes annual production of standard opera and/or contemporary chamber work with staging, costumes and scenery.
- 609 PERCUSSION ENSEMBLE** 1 credit  
Membership by audition. Study and performance of literature for various percussion groups; develops skill in ensemble performance.
- 610 WOODWIND ENSEMBLE** 1 credit  
Membership by audition. Study and performance of woodwind literature from all periods for various combinations of woodwinds. Develops performance skills and knowledge of woodwind literature.
- 611 CHAMBER ORCHESTRA** 1 credit  
Membership by audition. Organization designed to study for performance the substantial repertoire for small orchestra. Open to a student of advanced ability.
- 614 KEYBOARD ENSEMBLE** 1 credit  
Involves three hours a week of accompanying. Keyboard major required to enroll for at least three years. Music education major may substitute another musical organization for one year.
- 615 JAZZ ENSEMBLE** 1 credit  
Membership by audition. Provides experience in jazz ensemble performance. A student is assumed to have knowledge of rudiments of music and some experience in jazz ensemble performance.
- 617 COLLEGIUM MUSICUM** 1 credit  
Prerequisite: permission of instructor. A musical ensemble that performs music written before 1750 on copies of authentic instruments.
- 618 SMALL ENSEMBLE-MIXED** 1 credit  
Chamber Ensemble, Baroque Ensemble and Contemporary Music Ensemble. Each is a group of diverse instruments which rehearses and performs a selected body of music.

- 619 **UNIVERSITY CHORAL UNION** 1 credit  
Membership by audition. Ensemble devoted to study and performance of choral masterworks. Registration for credit open to all students who are not vocal music majors.
- 620 **CONCERT CHOIR** 1 credit  
Membership by audition. Highly select mixed choir. Performs classical literature from all periods. Campus, regional, and tour performances. "Major conducted ensemble" for vocal majors.
- 621 **UNIVERSITY SINGERS** 1 credit  
Membership by audition. Mixed ensemble devoted to performance of a wide variety of choral literature from classical to popular. "Major conducted ensemble" for vocal majors.
- 623 **MADRIGAL SINGERS** 1 credit  
Membership by audition. Ensemble devoted to performance of vocal chamber music of the Renaissance. Presents madrigal feasts and concerts on and off campus. Fall semester.
- 624 **OPERA CHORUS** 1 credit  
Open to students and members of University community by audition. Rehearsal and production of opera and musical theatre literature with staging, costumes, and scenery.
- 625 **CONCERT BAND** 1 credit  
Membership by Audition. Performs the finest in concert band literature available for concert bands today.
- 626 **MARCHING BAND** 1 credit  
This organization is noted for its high energy performances a University football games. Enrollment is open to all members of the University student body.
- 627 **BLUE AND GOLD BRASS** 1 credit  
The official band for Akron home basketball games. Membership is by audition.
- 628 **UNIVERSITY BAND** 1 credit  
This ensemble is active during spring Semester Only. This concert band is open to all members of the University Community.

## APPLIED MUSIC

### 7520:

- 521-569 **APPLIED MUSIC FOR MUSIC MAJORS** 2 or 4 credits each  
The following courses are intended for a student majoring in one of the programs in the Department of Music. Courses levels correspond approximately to class standing (100 for freshman, 200 for sophomore, etc.) A student may progress up one level by successfully completing an applied music jury, usually offered in the spring semester. NOTE: No more than eight credits at the 100, 200 or 300 level may apply in music degree programs; no such limit exists for the 400 level.

- 521 **PERCUSSION**
- 522 **CLASSICAL GUITAR**
- 523 **HARP**
- 524 **VOICE**
- 525 **PIANO**
- 526 **ORGAN**
- 527 **VIOLIN**
- 528 **VIOLA**
- 529 **CELLO**
- 530 **STRING BASS**
- 531 **TRUMPET OR CORNET**
- 532 **FRENCH HORN**
- 533 **TROMBONE**
- 534 **BARITONE**
- 535 **TUBA**
- 536 **FLUTE OR PICCOLO**
- 537 **OBOE OR ENGLISH HORN**
- 538 **CLARINET OR BASS CLARINET**
- 539 **BASSOON OR CONTRABASSOON**
- 540 **SAXOPHONE**
- 541 **HARPSICHORD**
- 542 **PRIVATE LESSONS IN MUSIC COMPOSITION** 2-4 credits each  
(May be repeated) Prerequisites: 7500:252 and permission of instructor; 7500:452 recommended. Private instruction in composition. Primarily for student whose major is theory-composition.
- 569 **JAZZ VOCAL STYLES**
- 621-661 **GRADUATE STUDY IN APPLIED MUSIC** 2 or 4 credits each  
(May be repeated) Prerequisites: undergraduate degree in music, graduate standing and/or permission of instructor determined through audition.
- 621 **PERCUSSION**
- 622 **CLASSICAL GUITAR**
- 623 **HARP**
- 624 **VOICE**
- 625 **PIANO**
- 626 **ORGAN**
- 627 **VIOLIN**
- 628 **VIOLA**
- 629 **CELLO**
- 630 **STRING BASS**
- 631 **TRUMPET OR CORNET**

- 632 **FRENCH HORN**
- 633 **TROMBONE**
- 634 **BARITONE**
- 635 **TUBA**
- 636 **FLUTE OR PICCOLO**
- 637 **OBOE OR ENGLISH HORN**
- 638 **CLARINET OR BASS CLARINET**
- 639 **BASSOON OR CONTRABASSOON**
- 640 **SAXOPHONE**
- 641 **HARPSICHORD**
- 642 **APPLIED COMPOSITION**
- 661 **JAZZ PERCUSSION**
- 662 **JAZZ GUITAR** 2-4 credits  
(May be repeated) Prerequisite: undergraduate degree with a major in music. Private instruction in composition offered primarily for a student majoring in composition. Another student may be approved by composition faculty.
- 663 **JAZZ ELECTRIC BASS**
- 664 **JAZZ PIANO**
- 665 **JAZZ TRUMPET**
- 666 **JAZZ TROMBONE**
- 667 **JAZZ SAXOPHONE**
- 668 **JAZZ COMPOSITION**
- 669 **JAZZ VOCAL STYLES**

## COMMUNICATION

### 7600:

- 500 **HISTORY OF JOURNALISM IN AMERICA** 3 credits  
A review and analysis of the historical evolution of journalism in America, focusing primarily on newspapers, magazines, radio, television.
- 508 **WOMEN, MINORITIES AND NEWS** 3 credits  
Study of images of women and minorities in U.S. news, along with the power women and minorities have as decision-makers in the news industry.
- 535 **COMMUNICATION IN ORGANIZATIONS** 3 credits  
Overview of theories and approaches for understanding communication flow and practices in organizations; including interdepartmental, networks, superior-subordinate, formal and informal communication.
- 536 **ANALYZING ORGANIZATIONAL COMMUNICATION** 3 credits  
Prerequisite: 535 or permission. Methodology for in-depth analysis and application of communication in organizations; team building, conflict management, communication flow. Individual and group projects; simulations.
- 537 **TRAINING METHODS IN COMMUNICATION** 3 credits  
Prerequisite: 345 or permission. Principles and concepts in the design and delivery of communication training programs; integration of theory and methodology; presentation skills; matching methods and learner needs.
- 554 **THEORY OF GROUP PROCESSES** 3 credits  
Group communication theory and conference leadership as applied to individual projects and seminar reports.
- 557 **PUBLIC SPEAKING IN AMERICA** 3 credits  
Survey and critical analysis of major speakers, speeches and speech movements in American history. Examines how style and content of American speaking influenced events and reflected their times.
- 562 **ADVANCED MEDIA WRITING** 3 credits  
Prerequisites: 201, 280, or equivalent. Analysis of production problems and design and their effect on writing scripts for electronic production.
- 566 **AUDIO AND VIDEO EDITING** 3 credits  
Prerequisites: 280. Theory and practice of editing audio and video for broadcast and corporate applications.
- 568 **ADVANCED AUDIO AND VIDEO EDITING** 3 credits  
Prerequisites: 280, 368, or equivalent. Advanced computerized multitrack audio and video editing. Theory and practice of multitrack sound mix for video productions.
- 571 **THEORIES OF RHETORIC** 3 credits  
Study of key figures in history of rhetorical theory, stressing interrelationships among theories of rhetoric, intellectual climates and social climates.
- 590 **COMMUNICATION WORKSHOP** 1-3 credits  
(May be repeated for a total of six credits) Group study or group projects investigating a particular phase of media not covered by other courses in curriculum.
- 593 **ELECTRONIC MEDIA PRODUCTION** 3 credits  
Prerequisite: permission. Practical application of writing, directing, management, recording, and editing skills to problems in electronic media production.
- 600 **INTRODUCTION TO GRADUATE STUDY IN COMMUNICATION** 3 credits  
Introduction to the ideas and scholarship that constitute the various research interests in the department.
- 603 **EMPIRICAL RESEARCH IN COMMUNICATION** 3 credits  
An introduction to elementary concepts of empirical and quantitative research and their application in studies of mass media research topics.
- 604 **INTRODUCTION TO QUANTITATIVE RESEARCH IN COMMUNICATION** 3 credits  
Prerequisite: 603 or equivalent. An introduction to reading and understanding research designs employing basic parametric and nonparametric descriptive and hypotheses testing statistical models in mass media-communication.
- 606 **COMMUNICATION PROBLEMS IN THE BASIC SPEECH COURSE** 1 credit  
Designed to train a graduate student in methods and materials of introductory speech course. Required of all teaching graduate assistants.

- 608 COMMUNICATION PEDAGOGY** 3 credits  
Familiarizes students with aspects of teaching communication and media courses at the college level.
- 623 AMERICAN MASS MEDIA SYSTEMS** 3 credits  
Analysis of role, performance and impact of media in America.
- 624 SURVEY OF COMMUNICATION THEORY** 3 credits  
Study of dimensions of field of communication: information analysis, social interaction and semantic analysis.
- 625 THEORIES OF MASS COMMUNICATION** 3 credits  
A review of theories of mass media and studies exploring the effect of media.
- 626 CONTEMPORARY ISSUES IN BROADCASTING** 3 credits  
Study of issues important to the management of radio and television broadcast station. Subscription to professional journal required.
- 628 CONTEMPORARY PUBLIC RELATIONS THEORY** 3 credits  
Study and practical application of communication concepts, theories and skills relevant to public relations programs in businesses and nonprofit organizations.
- 631 SEMINAR: ADVANCED PRODUCTION DESIGN I** 3 credits  
Prerequisites: demonstrated competence in either photography, film, or video production and permission of instructor. Analysis of communication problems and the design of solutions mediated by film, video and photography. Emphasis on production research and writing in various media formats. Design and production of a major project.
- 632 SEMINAR: ADVANCED PRODUCTION DESIGN II** 3 credits  
Prerequisite: 631. Continuation of projects in 631 and an opportunity for students to work in additional media.
- 635 ISSUES IN LEGAL REGULATION OF THE MEDIA** 3 credits  
Structure of the regulatory system; current regulatory issues in print, film, radio and television broadcasting, pay and cable TV.
- 645 INTERCULTURAL COMMUNICATION THEORY** 3 credits  
Analysis of the impact on the communication process of cultural difference between communicators; examination of existing literature in intercultural communication.
- 665 THEORIES OF ARGUMENT AND PERSUASION** 3 credits  
Prerequisites: undergraduate course in argumentation and in persuasion, or permission of instructor. Analysis of principal theories related to attitude formation and change.
- 670 COMMUNICATION CRITICISM** 3 credits  
Introduces the basic elements, approaches and types of critical discourse as it is relevant to communication and mass media studies.
- 675 SEMINAR ON RHETORICAL CRITICISM** 3 credits  
(May be repeated for a total of six credits.) Organized around special problems and methods involved in analysis of different genres, forms and topics of discourse.
- 676 SEMINAR IN RHETORICAL THEORY** 3 credits  
Concentrated study and research of ancient, modern or contemporary writers or on some specific topic in rhetorical theory.
- 678 RHETORICAL ELEMENTS SOCIAL MOVEMENTS** 3 credits  
Examines role and function of collective rhetorical discourse in affecting change. Focus on various rhetorical methodologies for understanding social movements and case studies.
- 680 GRADUATE COMMUNICATION INTERNSHIP** 1-6 credits  
(May be repeated for a total of six credits.) Prerequisites: must have attained the category of full admission and be in good standing in the School's graduate program; must receive permission and approval of internship placement and research proposal. Provides communication graduate students with opportunity to obtain experience and to apply knowledge of academic concepts in a supervised work setting in the communication field.
- 686 STUDIES IN COMMUNICATION MEDIA: RADIO** 3 credits  
Study of radio station programming.
- 687 STUDIES IN COMMUNICATION MEDIA: TELEVISION** 3 credits
- 691 ADVANCED COMMUNICATION STUDIES** 3 credits  
(May be repeated for a total of six credits.) Special topics in communication in areas of particular faculty expertise. Consult department for particular topic each semester.
- 692 SEMINAR IN FILM** 3 credits  
Prerequisite: permission of instructor. Advanced historical and critical study of works and institutions in film and video. Topics vary.
- 697 GRADUATE RESEARCH IN COMMUNICATION** 1-6 credits  
(May be repeated for a total of six credits.) Prerequisites: 7800-600 and approval of project prospectus one term prior to undertaking the project. Performance of research on problems found in mass media-communication.
- 698 MASTER'S PROJECT/PRODUCTION** 1-6 credits  
(May be repeated for a total of six credits.) Prerequisite: Permission of the school director.
- 699 MASTER'S THESIS** 1-6 credits  
(May be repeated for a total of six credits.) Prerequisite: Permission of the school director.
- 560 SPEECH-LANGUAGE AND HEARING DISORDERS IN THE PUBLIC SCHOOLS** 2 credits  
(Not open to communicative disorders major) Nature, causes and treatment of speech, hearing and language disorders in public schools. Special reference to role of classroom teacher in identifying and referring student with suspected problems and in working with school clinician.
- 561 ORGANIZATION AND ADMINISTRATION: PUBLIC SCHOOL SPEECH-LANGUAGE AND HEARING PROGRAMS** 2 credits  
Prerequisites: Senior or graduate standing. For clinicians who plan to work in public school systems. Covers program requirements and professional/ethical issues imposed by PL 94-142.
- 583 COMMUNICATION DISORDERS: GERIATRIC POPULATION** 3 credits  
(Not open to communicative disorders major) Examination of communication disorders that exist in geriatric population. Focus on etiology, symptomatology and concomitant rehabilitative procedures. Designed for a student interested in the aging population.
- 585 COMMUNICATIVE DISORDERS IN THE DEVELOPMENTALLY DISABLED** 4 credits  
Theory and current research related to the etiology, diagnosis and remediation of communicative disorders in intellectually and/or neuromotorically delayed children.
- 590 WORKSHOP: SPEECH-LANGUAGE PATHOLOGY AND/OR AUDIOLOGY** 1-3 credits  
(May be repeated for a total of four credits) Prerequisite: permission. Group investigation of particular phase of speech pathology and/or audiology not offered by other courses.
- 601 ADMINISTRATION AND SUPERVISION IN SPEECH AND HEARING PROGRAMS** 4 credits  
Prerequisite: permission of instructor. Organization and management of speech and hearing programs in voluntary and official agencies. Philosophy and methodology in supervision of services.
- 610 INSTRUMENTATION IN SPEECH PATHOLOGY AND AUDIOLOGY** 2 credits  
Principles and use of clinical and research instrumentation in speech and hearing.
- 611 RESEARCH METHODS IN COMMUNICATIVE DISORDERS I** 3 credits  
Introduction to experimental design in field of communicative disorders.
- 612 RESEARCH METHODS IN COMMUNICATIVE DISORDERS II** 2 credits  
Prerequisite: 611. Advanced experimental methods; development of a research study.
- 619 ADULT DYSPARTHRIA AND APRAXIA** 2 credits  
Development, symptoms, diagnosis and treatment of adult dysarthria and apraxia.
- 620 ARTICULATION** 2 credits  
Historical background, current theories and research related to etiology, evaluation and treatment of articulation and phonology disorders.
- 621 COMMUNICATIVE DISORDERS IN CLEFT PALATE** 2 credits  
Historical background, current theories and research related to etiology, diagnosis and treatment of cleft palate.
- 623 SUPPORT SYSTEMS FOR INDIVIDUALS AND FAMILIES WITH COMMUNICATIVE DISORDERS** 2 credits  
Enhances students' abilities to interview, provide educational information, and create support systems for persons with communicative handicaps and their families.
- 624 APHASIA** 2 credits  
Historical background, current theories and research related to etiology, diagnosis and treatment of adult aphasia.
- 625 LANGUAGE DEVELOPMENT: NORMAL AND DISORDERED** 3 credits  
Survey of research in normal and disordered development of language skills.
- 626 VOICE PATHOLOGY** 3 credits  
Prerequisite: permission of the instructor. Background and current research related to normal vocal function as well as the etiology, diagnosis, and therapy of various disorders of voice.
- 627 STUTTERING: THEORIES AND THERAPIES** 2 credits  
Reading and discussion of selected theories and therapies.
- 628 TOPICS IN DIFFERENTIAL DIAGNOSIS OF SPEECH AND LANGUAGE DISORDERS** 2 credits  
(May be repeated for a total of four credits) Prerequisite: permission of director of Speech and Hearing Center
- 629 TOPICS: SPEECH PATHOLOGY AND AUDIOLOGY** 2 credits  
Prerequisite: permission of instructor. Selected current topics in clinical and/or experimental areas of speech pathology, audiology, or language. Emphasis on review of current and historical literature.
- 630 LANGUAGE SKILLS IN CHILDREN: ASSESSMENT AND INTERVENTION** 3 credits  
Prerequisite: 625 or permission of instructor. Theoretical and applied study of child-language assessment and intervention strategies.
- 631 ACQUIRED BRAIN INJURY** 3 credits  
Prerequisites: permission of instructor. A study of behavioral deficits, stages of recovery, assessment techniques, and principles of cognitive rehabilitation related to closed head injury.
- 632 DYSPHAGIA** 2 credits  
Outlines etiology, assessment, and treatment for infants, children, and adults with feeding and swallowing disorders (dysphagia). It provides actual experiences in diagnosis and feeding techniques.
- 638 SEMINAR IN LANGUAGE AND SPEECH OF THE HEARING IMPAIRED** 2 credits  
Study of development of language and speech in hearing-impaired children, emphasizing psycholinguistic approach, and means of intervention. Communicative processes of hearing-impaired adults. Effect of conditions of minimum auditory stimulation and acoustic feedback on speech and language. Methods of speech conservation.
- 639 ADVANCED CLINICAL TESTING** 4 credits  
Theoretical basis for pure tone, speech tests, masking and acoustic impedance measurements. Review of classical and current literature relative to above tests.
- 640 SPECIAL TESTS/MEDICAL AUDIOLOGY** 4 credits  
Prerequisite: 639 or permission of instructor. Underlying psychoacoustic principles of administration and interpretation of site-of-lesion tests. Relationship between otology and audiology; application of clinical audiology in medical environment.
- 641 AMPLIFICATION** 3 credits  
Prerequisite: 639 or permission of instructor. Components of amplification systems; methods of evaluating hearing aid performance.
- 642 PEDIATRIC AUDIOLOGY** 2 credits  
Prerequisite: 639 or permission of instructor. Etiology of hearing loss in children, techniques for testing preschool and school-age children and other difficult-to-test clients.
- 643 INDUSTRIAL AUDIOLOGY** 2 credits  
Prerequisite: 639 or permission of instructor. Theoretical principles of noise measurement; etiology of noise-induced hearing loss and acoustic trauma; industrial hearing conservation programs; Occupational Safety and Health Act (O.S.H.A.) regulations.
- 644 AURAL REHABILITATION** 4 credits  
Prerequisite: permission of instructor. Review of current methodologies employed in aural rehabilitation of children and adults as well as current and potential areas of research.

## **SPEECH-LANGUAGE PATHOLOGY & AUDIOLOGY**

### **7700:**

- 530 ASPECTS OF NORMAL LANGUAGE DEVELOPMENT** 3 credits  
(Not open to communicative disorders major) Introduction to acquisition and development of comprehension and production of language – phonologically, semantically and syntactically. Relates language acquisition to perceptual development of child and looks at function of language in individual, family and school.
- 540 AUGMENTATIVE COMMUNICATION** 3 credits  
Prerequisite: 330 or 430/530 or permission of instructor. Overviews augmentative communication systems—candidates, symbol systems, devices, vocabulary, funding. Considers interdisciplinary issues in assessment/intervention.
- 545 MULTICULTURAL CONSIDERATIONS FOR AUDIOLOGISTS AND SPEECH-LANGUAGE PATHOLOGISTS** 2 credits  
Prerequisite: 7700.110 or graduate standing. This course introduces the multicultural considerations faced by audiologists and speech-language pathologists providing services to families and individuals with communication disorders.

- 645 EVOKED POTENTIALS** 2 credits  
Prerequisite: permission of instructor. A study of auditory, visual and somatosensory evoked potentials and their clinical applications in audiology and neuro-otology.
- 647 EXPERIMENTAL AUDIOLOGY** 2 credits  
Prerequisites: six graduate audiology credits or permission of instructor. Principles of psychoacoustics. Review of instrumentation and research techniques. Study of significant literature in the field.
- 649 ELECTRONYSTAGMOGRAPHY** 2 credits  
Prerequisite: permission of instructor. Study of the anatomy and physiology of the vestibular system; nystagmus; electronystagmographic (ENG) recording procedures; ENG protocols; interpretation of ENG results.
- 650 ADVANCED CLINICAL PRACTICUM: DIFFERENT DIAGNOSIS** 1 credit  
Prerequisite: Permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in diagnostic procedures. Includes preparation of reports.
- 651 ADVANCED CLINICAL PRACTICUM: VOICE** 1 credit  
Prerequisite: 626 or permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in treatment of voice disorders. Includes diagnostic/therapy procedures and preparation of reports.
- 652 ADVANCED CLINICAL PRACTICUM: FLUENCY** 1 credit  
Prerequisite: 627 or permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in treatment of fluency disorders. Includes diagnostic/therapy procedures and preparation of reports.
- 654 ADVANCED CLINICAL PRACTICUM: DIAGNOSTIC AUDIOLOGY** 1 credit  
Prerequisite: Permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in audiology diagnostics. Includes diagnostic procedures and preparation of reports.
- 655 ADVANCED CLINICAL PRACTICUM: ARTICULATION** 1 credit  
Prerequisite: 321 or permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in treatment of articulation disorders. Includes diagnostic/treatment procedures and preparation of reports.
- 656 ADVANCED CLINICAL PRACTICUM: LANGUAGE** 1 credit  
Prerequisite: Permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in treatment of language disorders. Includes diagnostic/treatment procedures and preparation of reports.
- 657 ADVANCED CLINICAL PRACTICUM: REHABILITATIVE AUDIOLOGY** 1 credit  
Prerequisite: Permission. (May be repeated for a maximum of six credits.) Supervised clinical practicum in hearing rehabilitation. Includes diagnostic/treatment procedures and preparation of reports.
- 695 EXTERNSHIP: SPEECH PATHOLOGY AND AUDIOLOGY** 2-4 credits  
Prerequisite: Permission. (May be repeated for a maximum of six credits.) Clinical practicum in a selected speech-language-hearing facility.
- 697 SPECIAL PROBLEMS: SPEECH PATHOLOGY AND/OR AUDIOLOGY** 1-3 credits  
(May be repeated for total of six credits) Prerequisite: permission of instructor. Guided research or reading in selected topics in speech pathology, audiology, or language disorders.
- 699 MASTER'S THESIS** 4-6 credits  
(May be repeated for a total of six credits) Prerequisite: permission of School Director.

## SOCIAL WORK 7750:

- 501 SOCIAL WORK PRACTICE I** 3 credits  
Prerequisite: 276 or permission of instructor. Basic concepts and methods of social work practice, particularly relating to understanding and working with individuals and families.
- 502 SOCIAL WORK PRACTICE II** 3 credits  
Prerequisite: 401 or permission of instructor. Concepts and methods of social work practice particularly relating to understanding and working with groups in various settings in our society.
- 503 SOCIAL WORK PRACTICE III** 3 credits  
Prerequisite: 401 or permission of instructor. Development of understanding and practice methods for utilization of community organization and social planning as social work process in assessing problems and developing programs to meet needs.
- 504 SOCIAL WORK PRACTICE IV** 3 credits  
Prerequisite: 401 or permission of instructor. Professional social work practice with families in social services; the dynamics of family systems, assessment of family function and dysfunction, professional helping processes.
- 510 MINORITY ISSUES IN SOCIAL WORK PRACTICE** 3 credits  
Prerequisite: 276 or permission of instructor; must be taken prior to or concurrently with 401 and one of the other practice courses (402, 403, 404). Racial, ethnic and cultural issues in social work related to various practice and theoretical perspectives, to various types of social problems, service agencies, individual family, group, community and societal contexts integrated with the methodological processes of the social work practitioners.
- 511 WOMEN'S ISSUES IN SOCIAL WORK PRACTICE** 3 credits  
Prerequisite: 276 or permission of instructor. Social work practice, knowledge and skill, social welfare institutions and social policy in relation to women's issues and concerns in the United States.
- 525 SOCIAL WORK ETHICS** 3 credits  
Prerequisite: 276 or permission of instructor. Social Worker's code of ethics as applied to practices, problems and issues in social work.
- 527 HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT I** 3 credits  
Prerequisite for 427: 276 or permission of instructor; for 527: permission of instructor. Social work perspective on human development across the life cycle. Human diversity approach consistent with the needs of social work students preparing for practice.
- 530 HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT II** 3 credits  
Prerequisites for 430: 276, 427 or permission of instructor; for 530: permission of instructor. Emphasis on social workers' understanding of and use of individual interaction and growth within family as a system, groups, roles, organizations, community, and culture.
- 540 SOCIAL WORK RESEARCH I** 3 credits  
Prerequisites for 440: 276 or permission of instructor; for 540: permission. Social work practitioner's role in utilization of scientific method in the conduct of practice and utilization of social work research as found in social work and social science literature for improvement and advancement of social work practice.

- 541 SOCIAL WORK RESEARCH II** 3 credits  
Prerequisite for 441:440 or permission of instructor; for 541: permission of instructor. Evaluation of social work intervention with individual, group and community. Processing and interpreting agency information for better practice, policy and administrative decisions.
- 545 SOCIAL POLICY ANALYSIS FOR SOCIAL WORKERS** 3 credits  
Prerequisite for 445: 276 or permission of instructor; for 545: undergraduate social work degree or permission. Description, analysis and construction of social policy in social services; to understanding forces and processes which establish or change social policies, to predict consequences of social policies, and to establish goals for social policy development; integrated into effective social work methodology.
- 550 SOCIAL NEEDS AND SERVICES FOR LATER ADULTHOOD AND AGING** 3 credits  
Prerequisite: 276 or permission of instructor. Application of knowledge and principles of professional social work practice to understanding, development and provision of social services to meet needs of aging and later maturity individuals, families and communities and institutions serving them and their relatives.
- 551 SOCIAL WORK IN CHILD WELFARE** 3 credits  
Prerequisite: 276 or permission of instructor. In-depth exploration of structure and functioning of social services designed to help children, and of practice of social work in child-welfare settings. Consideration of supportive, supplementary, and substitutive services.
- 552 SOCIAL WORK IN MENTAL HEALTH** 3 credits  
Prerequisite: 276 or permission of instructor. Issues, organization, development, and methodologies of current professional social work practice in mental-health settings.
- 554 SOCIAL WORK IN JUVENILE JUSTICE** 3 credits  
Prerequisite: 276 or permission of instructor (undergraduate). The theory and practice of social work in the juvenile justice systems of the United States. Traditional procedures and recent developments, prevention, diversion and community outreach, legal concerns, case management, institutional functioning.
- 555 THE BLACK FAMILY** 3 credits  
Prerequisite: 276 or permission of instructor. Contemporary problems facing black families; male-female relationships, single parent households, black teens and elderly, public policy, theoretical models, explaining development of the black family.
- 556 SOCIAL WORK IN HEALTH SERVICES** 3 credits  
Prerequisite: 276 or permission of instructor. Policies, programs and practice in health-care settings: short-term, intermediate and long-term, hospitals, out-patient services, emergency services, clinics, visiting nurse services, nursing homes, pediatric services, self-help organizations.
- 557 ADVANCED PRACTICE WITH INDIVIDUALS** 3 credits  
Prerequisite: 401 or permission of instructor (undergraduate); undergraduate social work degree or permission (graduate). Advanced professional development of direct and indirect strategies and techniques of intervention to aid individuals in improving psychosocial functioning.
- 558 ADULT DAY CARE** 3 credits  
Prerequisite for 458: 276 or permission of instructor; for 558: permission of instructor. Planning, development, implementing, evaluating, and delivery of adult day-care services.
- 559 SOCIAL WORK WITH THE MENTALLY RETARDED** 3 credits  
Prerequisite: 276 or permission of instructor. Application of social work principles in the provision of social services to meet the need of the mentally retarded and developmentally disabled and their families.
- 565 ADMINISTRATION AND SUPERVISION IN SOCIAL WORK** 3 credits  
Prerequisite: 401 or permission of instructor. Preparation for use of supervision, staff development and program planning in a social work agency. Examines the social work/welfare agency in its community as it affects its organizational goal-setting and program-implementation problems.
- 570 LAW FOR SOCIAL WORKERS** 3 credits  
Prerequisite: 276 or permission of instructor. Basic terminology, theories, principles, organization, and procedures of law will be explored along with the relationships between social work and law and comparisons of the theoretical bases of the two professions.
- 575 SUBSTANCE ABUSE AND SOCIAL WORK PRACTICE** 3 credits  
Prerequisite: 276 or permission of instructor. Provides students with the essential knowledge and skill for successful social work practice with people involved in substance abuse.
- 580 SPECIAL TOPICS IN SOCIAL WORK AND SOCIAL WELFARE** 1-3 credits  
Prerequisite: permission of instructor. Analysis of current social work and social welfare theory and policy, settings, innovative interventions and trends in delivery systems in relation to selected areas of concern. Topics and credits variable.
- 590 SOCIAL WORK WORKSHOP** 1-4 credits  
(May be repeated for a total of six credit) Prerequisite: permission of instructor. Group investigation of a particular phase of social work or social welfare not offered by other courses in curriculum.
- 597 INDIVIDUAL INVESTIGATIONS IN SOCIAL WORK SOCIAL WELFARE** 1-3 credits  
Prerequisites: permission and prearrangement with instructor. Individual readings, research or projects in area of interest in social welfare theory or institutional operations or in social work practice under guidance of social work faculty member. Preparation of report paper appropriate to nature of topic. For social work major.
- 601 FOUNDATION FIELD PRACTICUM** 3 credits  
Prerequisites: graduate status; currently enrolled in or completed foundation coursework. A 2 semester course consisting of a 400 clock hour, supervised internship at a social service agency. (Offered every Fall Semester.)
- 602 FOUNDATION FIELD PRACTICUM** 3 credits  
Prerequisites: graduate status; currently enrolled in or completed foundation coursework. A 2 semester course consisting of a 400 clock hour, supervised internship at a social service agency. (Offered every Spring Semester.)
- 603 ADVANCED FIELD PRACTICUM** 3 credits  
Prerequisites: graduate status; currently enrolled in or completed second year coursework. A 2 semester course consisting of a 600 clock hour, supervised internship in a social service agency, based on the student's concentration and specialization. (Offered every Fall Semester.)
- 604 ADVANCED FIELD PRACTICUM** 3 credits  
Prerequisites: graduate status; currently enrolled in or completed second year coursework. A 2 semester course consisting of a 600 clock hour, supervised internship in a social service agency, based on the student's concentration and specialization. (Offered every Spring Semester.)
- 605 SOCIAL WORK PRACTICE WITH LARGE SYSTEMS** 3 credits  
Prerequisite: 604 or permission of instructor. Provides the basic knowledge, skills, and strategies of social work practice with task groups, organizations and communities.
- 607 ADVANCED PRACTICE WITH SMALL SYSTEMS I** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course focuses on the differential assessment of individuals, families and small groups and the application of a range of theory bases.

- 608 ADVANCED PRACTICE WITH SMALL SYSTEMS II** 3 credits  
Prerequisite: 704 or permission of instructor. As a continuation of Advanced Practice I, this course focuses on the development and implementation of intervention strategies with and on behalf of small systems.
- 609 SOCIAL WORK PRACTICE WITH SMALL SYSTEMS** 3 credits  
Prerequisite: graduate status or permission of instructor. Provides the basic knowledge, skills, professional ethics and values necessary for beginning social work practice with small client systems.
- 611 DYNAMICS OF RACISM AND DISCRIMINATION** 3 credits  
Prerequisite: graduate status or permission of instructor. Provides knowledge of analyzing and understanding the factors leading to and sustaining racism, sexism, homophobia, and the like, at micro and macro levels.
- 622 FUNDAMENTALS OF RESEARCH I** 3 credits  
Prerequisite: graduate status or permission of instructor. This course provides an Introduction to the logic of scientific inquiry, the research process, and the relationship between research and social work practice.
- 623 FUNDAMENTALS OF RESEARCH II** 3 credits  
Prerequisite: 622; statistics course; or permission of instructor. Provides students with an understanding of quantitative and qualitative methodologies and the use of descriptive and inferential statistics in analyzing research data.
- 631 HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT: SMALL SOCIAL SYSTEMS** 3 credits  
Prerequisite: graduate status or permission of instructor. This course focuses on understanding the human behavior and life cycle development of people as individuals and as members of families and other small groups.
- 632 HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT: LARGE SYSTEMS** 3 credits  
Prerequisites: 631 or permission of instructor. This course focuses on the human behavior of people as members of larger social systems including formal and informal organizations, communities and institutions.
- 646 SOCIAL WELFARE POLICY I** 3 credits  
Prerequisite: graduate status or permission of instructor. Examines the historical, philosophical and value bases of social welfare as well as the relationship between social work practice, policy and service delivery.
- 647 SOCIAL WELFARE POLICY II** 3 credits  
Prerequisite: 646 or permission of instructor. This course prepares students with the beginning skills to engage in social problem/policy analysis.
- 650 ADVANCED STANDING INTEGRATIVE SEMINAR** 6 credits  
Prerequisite: advanced standing. Provides an integrative view of social work practice with an emphasis on values, foundation knowledge and skills, and evaluation of professional interventions.
- 656 SOCIAL WORK PRACTICE WITH GAYS AND LESBIANS** 3 credits  
Prerequisite: second level graduate status or permission of instructor. This course examines gay and lesbian culture and lifestyles, discrimination based on sexual orientation, and intervention strategies appropriate to practice with gays and lesbians.
- 663 PSYCHOPATHOLOGY AND SOCIAL WORK** 3 credits  
Prerequisite: second level graduate student or permission of instructor. An examination of the symptoms, theories, and psychosocial aspects of mental illness, and the role of the social worker in the treatment of mental disorders.
- 664 SINGLE SYSTEM DESIGN** 3 credits  
Prerequisite: second level graduate student or permission of instructor. Provides students with advanced knowledge about the methodology of single system design and skills to implement an evaluation study of their intervention with clients.
- 665 SUPERVISION AND STAFF DEVELOPMENT** 3 credits  
Prerequisite: second level graduate student or permission of instructor. An examination of the purpose, functions, and theories of supervision; the impact of cultural, ethnic and racial differences in supervision/staff development; and problems encountered.
- 671 SOCIAL WORK ADMINISTRATION** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course focuses on supervisory and managerial roles and functions as they are carried out at different hierarchical levels in human service organizations.
- 672 STRATEGIES OF COMMUNITY ORGANIZATION** 3 credits  
Prerequisite: second level graduate student or permission of instructor. Emphasizes the historical development and application of several community strategies used to identify community problems, and how to organize and empower diverse community groups.
- 673 CONTEMPORARY SOCIAL WORK APPLICATIONS** 3 credits  
Contemporary social work concepts and methods compared and applied in various social welfare, community service, educational and health settings. Particularly useful for professionals from related fields and for advanced practitioners.
- 674 COMMUNITY, ECONOMIC SYSTEMS AND SOCIAL POLICY ANALYSIS** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course provides a base for understanding economic systems and analyzing the political framework at federal, state, and local levels and their impact on communities.
- 675 PROGRAM EVALUATION** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course provides students with methods of evaluating programs in agencies, including approaches, measurement, design, data collection and analyses employed in program outcome research.
- 676 FISCAL MANAGEMENT OF SOCIAL AGENCIES** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This elective course concentrates on the financial management of social administration, financial planning and management, principles of economic and fiscal exchange, accountability and fiscal accounting.
- 680 AGING AND SOCIAL WORK PRACTICE** 3 credits  
Prerequisite: second level graduate student or permission of instructor. An examination and evaluation of aging programs and policies, demographic trends and the changing role of social work service providers.
- 681 AGING: POLICIES AND PROGRAMS** 3 credits  
Prerequisite: second level graduate student or permission of instructor. An examination and evaluation of aging programs and policies, demographic trends and the changing role of social work service providers.
- 685 SOCIAL WORK PRACTICE: FAMILY AND CHILDREN** 3 credits  
Prerequisite: second level graduate student or permission of instructor. Examines the major problems encountered by children and families in the life cycle and explores intervention strategies and programs to address their needs and strengths.
- 686 SOCIAL WELFARE POLICY AND SERVICES: FAMILY AND CHILDREN** 3 credits  
Prerequisite: second level graduate student or permission of instructor. Examines the federal and state laws, policies, and services governing children and families, including the supportive, supplemental and substitutive aspects of services.
- 690 ADVANCED PRACTICE AND POLICY IN SUBSTANCE ABUSE** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course provides students the knowledge and skill base necessary for managing and practice with people involved in substance abuse, evaluating programs, and preventive work.
- 695 HEALTH CARE: PLANNING AND POLICY ISSUES** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course is designed to orient students to the planning and policy issues in health care, and how social work can interface with health care.
- 696 EPIDEMIOLOGIC ANALYSIS OF HEALTH AND SOCIAL PROBLEMS** 3 credits  
Prerequisite: second level graduate student or permission of instructor. This course applies the epidemiological method to social work practice, such as treatment groups, making administrative decisions, in planning and evaluation, and doing preventive work.
- 755 IMPLICATIONS OF DIVERSITY FOR SOCIAL WORK PRACTICE** 3 credits  
Prerequisite: second level graduate student or permission of instructor. Provides content on the culture and unique strengths of diverse groups and the implications for social work practice at the community level.
- 773 INTRODUCTION TO COMMUNITY ORGANIZATION AND PLANNING** 3 credits  
Prerequisite: second level graduate student or permission of instructor. A description and analysis of various theoretical concepts and strategic ideas that are used as a framework for Community Organization (CO) practice.

## THEATER

### 7800:

- 567 CONTEMPORARY THEATER STYLES** 3 credits  
A detailed examination of representative plays of the contemporary theater.
- 575 ACTING FOR THE MUSICAL THEATER** 3 credits  
Prerequisite: permission. A scene study course in analyzing and performing roles in American musicals. Accompanist provided.
- 590 WORKSHOP IN THEATER ARTS** 1-3 credits  
May be repeated for a total of six credits toward degree. Prerequisite: advanced standing or permission. Group study or group projects investigating particular phase of theater arts not covered by other courses in curriculum.
- 600 INTRODUCTION TO GRADUATE STUDIES** 3 credits  
Exploration of the basic research tools and methods appropriate to the discipline, including utilization of the computer. Guidelines for writing thesis.
- 603 SPECIAL TOPICS IN THEATER ARTS** 1-4 credits  
(May be repeated as different subject areas are covered, but no more than 12 credits may be applied toward M. A. degree) Traditional and experimental courses in theater, supplementing those listed in the *General Bulletin*.
- 605 COLLOQUIUM ON THE ARTS** 3 credits  
A brief exploration of the major visual and performing art forms and organizations examined in relationship to the business management of arts. Team-taught.
- 633 SUMMER THEATER** 3 credits  
Prerequisite: permission of instructor/audition. Practical laboratory experience in on or more discipline during the summer doing production and/or management work at advanced level. (May be repeated to 12 credits.)
- 641 PROBLEMS IN DIRECTING** 3 credits  
Advanced directing course with special emphasis on staging of complex plays from all periods of dramatic literature.
- 645 SEMINAR IN DRAMATIC LITERATURE** 3 credits  
Representative Western stage play (non-American) are examined in theatrical, historical, and critical/theoretical contexts.
- 646 GRADUATE ACTING: TECHNIQUES** 3 credits  
Advanced study of basic acting techniques, especially Stanislavski, through analysis and performance. Voice/Movement Lab required.
- 648 GRADUATE ACTING: PROBLEMS** 3 credits  
Study of problems confronting the advanced actor in various modern styles of performance. Voice/Movement Lab required.
- 655 DRAMATIC THEORY AND CRITICISM** 2 credits  
An exploration of the major dramatic theorists and critics from Classical Greek to the present, with an emphasis on the 20th Century.
- 658 HISTORY OF TECHNICAL PRODUCTION** 3 credits  
Theater history from the Greeks to the present with emphasis on physical theater, conventions, and theater architecture of each period.
- 659 HISTORY AND THEORY OF STAGE LIGHTING** 3 credits  
Historical survey of evolution of stage lighting culminating in understanding of modern lighting design skills and their practical application. Term paper or major project required.
- 660 ADVANCED TECHNICAL THEATER** 2 credits  
Processes including multiple set productions, revolves and their rigging, techniques in simple hydraulics, pneumatics and load capacities, and properties and techniques in multi-media.
- 662 SEMINAR IN SCENT DESIGN** 3 credits  
Prerequisite: 108 or undergraduate scene design course or permission of instructor. Study of problems in scene design; portfolio projects, research of noted designers, studies of theater spaces, and new scenographic materials.
- 665 AUDIENCE DEVELOPMENT** 3 credits  
Developing audiences for the Arts through Arts marketing techniques, including season and single ticket campaigns, promotional strategies, media/public relations, market research, and telemarketing.
- 666 PRINCIPLES OF ARTS ADMINISTRATION** 3 credits  
Principles and practices in non-profit arts management, including organizational structure, function of boards, personnel and volunteer management, and public policy for the arts.
- 682 FUND RAISING AND GRANTSMANSHIP IN THE ARTS** 3 credits  
Techniques and execution of a development campaign for individuals, corporations, foundations, federal and state grants, and endowment, including research and proposal writing.
- 690 GRADUATE RESEARCH/READINGS** 1-3 credits  
(May be repeated for a total of nine credits) Prerequisite: permission. Individual research or independent readings under supervision of member of theater graduate faculty.

- 691 ARTS ADMINISTRATION PRACTICES AND POLICIES** 3 credits  
Financial management of the arts, facilities management, presenting performances, touring, and unique management problems in non-profit theater companies, dance companies, orchestras, and museums.
- 692 LEGAL ASPECTS OF ARTS ADMINISTRATORS** 3 credits  
Legal responsibilities and liabilities of an arts organization, contracts, copyright law, insurance, taxation, artists' rights, personnel law, and labor law.
- 698 INTERNSHIP** 3-6 credits  
Prerequisite: permission. Faculty supervised work experience in which student participates in an arts management, performance or technical situation with a selected cultural organization.
- 699 MASTER'S THESIS** 1-6 credits  
(May be repeated for a total of six credits) Prerequisite: permission of graduate coordinator of theater arts program. Research related to the completion of the master's thesis.

## THEATER ORGANIZATIONS

### 7810:

- 601 PRODUCTION PRACTICUM/DESIGN/TECHNOLOGY** 1-2 credits  
(May be repeated for a total of four credits) Prerequisite: permission of instructor. Practice in selected production design/technology operations, applications and techniques as they apply to production projects and major departmental productions.
- 605 PERFORMANCE PRACTICUM** 1-2 credits  
(May be repeated for a total of 12 credits) Prerequisite: permission of project adviser. Recognition of work undertaken by the student when performing a role in a theater production. Credit assigned and work supervised by faculty project supervisor.

## DANCE

### 7900:

- 590 WORKSHOP IN DANCE** 1-3 credits  
(May be repeated for a total of eight credits) Prerequisite: advanced standing or permission. Group study or group projects investigating particular phase of dance not covered by other courses in curriculum.

## DANCE PERFORMANCE

### 7920:

- 590 WORKSHOP IN DANCE** 1-3 credits  
Prerequisite: Advanced standing or permission. (May be repeated for a total of eight credits). Group study/projects investigating a particular field of dance not covered by other courses.

# College of Nursing

## NURSING 8200:

- 509 INTERNATIONAL NURSING** 3 credits  
Prerequisite: Admission in MSN program. A comparison of nursing roles and responsibilities in an international environment. The influences of education, ethics, government, demography, and geography on health care will be considered.
- 589 SPECIAL TOPICS: NURSING** 1-4 credits  
(May be repeated as new topics are presented) Group studies of special topics in nursing. May not be used to meet requirements for the major in nursing. May be used for elective credit.
- 593 WORKSHOPS** 1-4 credits  
(May be repeated as new topics are presented) Selected topics in nursing. May be used to meet undergraduate/graduate requirements at the discretion of the college.
- 598 SPECIAL READINGS** 1-4 credits  
Prerequisite: permission of student's adviser or dean. Special readings in an area of concentration may be taken to satisfy elective credit. Special readings may not be used to satisfy requirements of the major.
- 603 THEORETICAL BASIS FOR NURSING** 3 credits  
Prerequisite: Admission to the Graduate Program. Overview of extant nursing science. Evaluation and critique of nursing conceptual models. Analysis of the relationships of theory, research, and practice.
- 605 COMPUTER APPLICATIONS IN NURSING** 2 credits  
Prerequisite: Admission to Graduate Program. Computer systems influencing nursing practice, research, education, and national knowledge exchange are examined. The complex issues surrounding their use in nursing are explored.
- 607 POLICY ISSUES IN NURSING** 2 credits  
Prerequisite: Admission to Graduate Program. Analysis of policy issues that impact on nursing and health care delivery to diverse population(s). Examine methods to shape policy, distribution, and allocation of resources.
- 608 PATHOPHYSIOLOGICAL CONCEPTS OF NURSING CARE** 3 credits  
Prerequisite: Acceptance into the MSN Program. In-depth study of pathological conditions and related treatment modalities. The course focuses on specific nursing interventions related to these pathophysiological abnormalities.
- 610 ADVANCED ADULT/GERONTOLOGICAL ASSESSMENT** 3 credits  
Prerequisites: Admission to Adult/Gerontological Nursing Practitioner sequence; 608. Corequisites: 621 or 671. Advanced adult/gerontological assessment and clinical reasoning in primary health care nursing with introduction to differential diagnosis and clinical management.
- 612 ADVANCED CLINICAL PHARMACOLOGY** 3 credits  
Prerequisite: 608. Examines principles of pharmacology and therapeutics for major pharmacologic agents used by Advanced Practice Nurses to manage adult/gerontological problems in primary health care settings.
- 613 NURSING INQUIRY I** 3 credits  
Prerequisite: Admission to graduate program. Concepts and ethical issues relating to scientific inquiry are examined, emphasizing the phases of the research process. Students participate in critical analysis of nursing research.
- 615 ADVANCED CLINICAL PRACTICE SEMINAR** 2 credits  
Prerequisite/corequisite: 627 or 657 or 667 or 677. Discusses issues, concepts, and theories relevant to the development of advanced clinical practice roles.
- 618 NURSING INQUIRY II** 4-6 credits  
Prerequisite: 613 and permission of instructor. Emphasis on development of competencies in scientific inquiry. Research practicum will involve a) a pilot study; or b) participation in faculty research.
- 621 GERONTOLOGICAL NURSING I** 3 credits  
Prerequisite/corequisite: Nurse Practitioner students only, 610. Physiological, psychological, and sociological theories of aging are analyzed in relation to nursing practice and nursing research. Nursing interventions focus on promoting and maintaining function.
- 625 GERONTOLOGICAL NURSING II** 4 credits  
Prerequisite: 621; prerequisite/corequisite: Nurse Practitioner students only, 690. Major nursing care problems and psychological disabilities are analyzed. Clinical focuses on development of skills to maintain and/or restore function.
- 627 GERONTOLOGICAL NURSING III** 4 credits  
Prerequisite: 625; corequisite: Nurse Practitioner students only, 692. Examine long term care and rehabilitation in institutions, and home and community settings. Clinical experiences focus on nursing responsibilities and interventions to promote optimum care.
- 629 PRACTICUM: GERONTOLOGICAL NURSING** 3 credits  
Prerequisite: 627; corequisite: Nurse Practitioner students only, 694. Integration of nursing knowledge and skills with an older population in episodic and long term care clinical situations.
- 630 RESOURCE MANAGEMENT IN NURSING SETTINGS** 3 credits  
Prerequisite: 603, 613, 3100-670, 6200-601. Examines management of fiscal and human resources in nursing service settings; analyzes impact of economics and labor relations on health and nursing care.
- 632 FISCAL MANAGEMENT IN NURSING ADMINISTRATION** 3 credits  
Prerequisite: Admission to M.S.N. program. Examines management of fiscal resources in nursing service settings.
- 635 ORGANIZATIONAL BEHAVIOR IN NURSING SETTINGS** 3 credits  
Prerequisites: 603, 3100-670, 6200-601. Examines organizational behavior theories/principles related to systems analysis and assessment of organizational structure in nursing settings.
- 638 PRACTICUM: NURSING ADMINISTRATION I** 5 credits  
Prerequisites: 630, 632 and 635. Leadership and management theories are utilized to guide study of the role of nurse administrator.

- 639 PRACTICUM: NURSING ADMINISTRATION II** 5 credits  
Prerequisite: 638. Leadership and management theories are utilized to guide practice of the role of nurse administrator.
- 640 SCIENTIFIC COMPONENTS OF NURSE ANESTHESIA** 3 credits  
Prerequisite: Acceptance Nurse Anesthesia. Corequisite: 603. The course presents content dealing with the chemical and physical components of anesthesia agents.
- 641 PHARMACOLOGY FOR NURSE ANESTHESIA I** 3 credits  
Prerequisites: 603, 607, 640. The study of intravenous induction agents, injectable analgesics and inhaled anesthetics commonly used in the administration of general anesthesia. Includes use of muscle relaxants.
- 643 PRINCIPLES OF ANESTHESIA I** 4 credits  
Prerequisite: 640. This course focuses on the acquisition of basic skills related to nursing anesthesia care and administration of anesthesia agents, with a focus on equipment.
- 644 PHARMACOLOGY FOR NURSE ANESTHESIA II** 3 credits  
Prerequisite: 641. Focuses on mechanisms of drug transport within the human body for inhaled and injected medications. The effects of accessory drugs are also discussed.
- 645 PRINCIPLES OF ANESTHESIA II** 4 credits  
Prerequisite: 643. Emphasis on pre-operative anesthesia care including induction techniques. Discusses airway management, fluid therapy, and ventilator use.
- 647 PROFESSIONAL ROLE SEMINAR** 2 credits  
Prerequisites: 644, 645. Discusses issues, concepts and theories related to the professional role of nurse anesthetists. Focuses on leadership/management content as well as professional ethical issues.
- 649 NURSE ANESTHESIA RESIDENCY** 0 credits  
Prerequisites: 644 and 645. Structured, supervised clinical experiences allowing students to apply knowledge and skills learned in the didactic portion of the nurse anesthesia curriculum.
- 650 ADVANCED PEDIATRIC/ADOLESCENT ASSESSMENT** 2 credits  
Prerequisites: Admission to Child and Adolescent Health Nursing I and 608; corequisite: 651. Advanced pediatric/adolescent assessment and clinical reasoning for primary health care nursing with introduction to differential diagnosis and clinical management.
- 651 CHILD AND ADOLESCENT HEALTH NURSING I** 4 credits  
Corequisite: 650. Primary health care nursing to enhance positive health behavior outcomes of well children/adolescents and those with minor health disruptions and problems in family/community contexts.
- 655 CHILD AND ADOLESCENT HEALTH NURSING II** 4 credits  
Prerequisite: 651. Corequisite: 613. Primary health care nursing to increase positive health behavior outcomes of children/adolescents with acute and/or chronic health disruptions in family/community contexts.
- 656 PHARMACOLOGY FOR CHILD AND ADOLESCENT HEALTH NURSING** 3 credits  
Prerequisite: Admission to Graduate Program. Emphasis on major categories of pharmacological agents, that influence developmental outcomes of children/adolescents in ambulatory, acute and chronic care environments.
- 657 CHILD AND ADOLESCENT HEALTH NURSING III** 4 credits  
Prerequisite: 655. Emphasis on advanced practice in primary health care using consultation and program development/marketing related to development and health behavior outcomes of children/adolescents and families.
- 659 PRACTICUM: CHILD AND ADOLESCENT HEALTH NURSING** 4 credits  
Prerequisite: 657. Corequisite: 615. Integration of knowledge and skills with a specified population of children/adolescents and their families. Emphasis on implementation of programmatic intervention and evaluation.
- 661 LIAISON-COMMUNITY MENTAL HEALTH NURSING I** 3 credits  
Prerequisites/corequisites: 603, 3100:670. Focuses on the mental health of individuals experiencing stress related to actual or potential health problems. Theoretical knowledge, interviewing, and direct interventions are emphasized.
- 662 PSYCHOPHARMACOLOGY** 1 credit  
Prerequisite: 608; corequisite: 612. Examines principles of pharmacology and therapeutics for psychopharmacologic agents used by Advanced Practice Psychiatric Nurses to manage adult mental health problems in various settings.
- 663 LIAISON-COMMUNITY MENTAL HEALTH NURSING INTERNSHIP** 2 credits  
Prerequisites: 661 and 665. Focuses on development of intervention skills utilizing knowledge of therapeutic techniques, psychopathology and pharmacology. Emphasis is on direct care of individuals with mental health problems.
- 665 LIAISON-COMMUNITY MENTAL HEALTH NURSING II** 4 credits  
Prerequisites: 661, 3100:670. Prerequisite/corequisite: 613. Focuses on liaison mental health nursing with families experiencing the stress of actual or potential health problems. Theoretical frameworks for direct intervention are examined.
- 667 LIAISON-COMMUNITY MENTAL NURSING III** 4 credits  
Prerequisite: 665. Prerequisite/corequisite: 3100:695. Focuses on liaison mental health nursing consultation with health-care professionals. Theoretical frameworks for indirect models of intervention in non-psychiatric settings are emphasized.
- 669 PRACTICUM: LIAISON-COMMUNITY MENTAL HEALTH NURSING** 3 credits  
Prerequisite: 667. Prerequisite/corequisite: 615. Synthesis of knowledge and skill related liaison mental health nursing with specific vulnerable populations. Emphasis in on implementation of programmatic interventions and evaluation.
- 671 ADULT HEALTH NURSING I** 3 credits  
Prerequisite/corequisite: Nurse Practitioner students only, 610. Research and theory integral to advanced nursing practice of adults/families with selected common health problems. Emphasis on comprehensive assessment, health promotion and risk reduction.
- 672 INDEPENDENT STUDY** 1-4 credits  
Opportunity for the advanced graduate nursing practice in a selected area of specialization.
- 675 ADULT HEALTH NURSING II** 4 credits  
Prerequisite: 671; corequisite: Nurse Practitioner students only, 690. Focuses on problems common to acute illness in adults in acute/episodic care settings. Multidisciplinary care planning and coordination are emphasized, including transition to community-based care.
- 677 ADULT HEALTH NURSING II** 4 credits  
Prerequisite: 675; corequisite: Nurse Practitioner students only, 692. Focuses on adult/family experiencing chronic illness in selected care settings. Emphasizes management of problems common to chronic care and rehabilitation.
- 679 PRACTICUM: ADULT HEALTH NURSING** 3 credits  
Prerequisite: 677; corequisite: Nurse Practitioner students only, 694. Integration of knowledge and skills with a specified population of adults and their families. Emphasis on implementation of programmatic interventions and evaluation.
- 682 NURSING CURRICULUM DEVELOPMENT** 3 credits  
Prerequisite: 603, 3100:670. Prerequisite/corequisite: 625 or 655 or 665 or 675. Examines curriculum development with a focus on teaching-learning strategies. Emphasis is on process of developing a curriculum.
- 683 EVALUATION IN NURSING EDUCATION** 3 credits  
Prerequisite: 682. Prerequisite/corequisite: 625 or 655 or 675. Application of principles of evaluation and measurement to situations in nursing education. Emphasizes evaluation as a process. Includes evaluation of teacher, learner and program.
- 684 PRACTICUM: THE ACADEMIC ROLE OF THE NURSE EDUCATOR** 6 credits  
Prerequisite/corequisite: 683. Participation in a nursing program with the purpose of understanding the full professional role. Contemporary issues in nursing and higher education are examined.
- 690 CLINICAL MANAGEMENT I** 2 credits  
Prerequisites: Admission to Adult/Gerontological Nursing Practitioner track; 612; 621 or 671. Corequisites: Adult/Gerontological Nursing Practitioner students only, 625 or 675. Clinical management of common chronic and acute problems of adults in primary health care settings. Focus on episodic management using differential diagnosis and clinical reasoning.
- 692 CLINICAL MANAGEMENT II** 2 credits  
Prerequisites: Admission to Adult/Gerontological Nursing Practitioner track; 625 or 671. Corequisites: 627 or 677. Clinical management of complex, chronic health problems of adults in primary health care settings. Focus on long term management using differential diagnosis and clinical reasoning.
- 694 CLINICAL MANAGEMENT III** 2 credits  
Prerequisites: Admission to Adult/Gerontological Nursing Practitioner track; 692; 627 or 677. Corequisites: 629 or 679. Clinical management of complex health problems using consultation, collaboration, and referral in selected primary health care settings.
- 699 MASTER'S THESIS** 1-6 credits  
Prerequisite: 613. Supervised research in a specific area of advanced nursing.

# College of Polymer Science and Polymer Engineering

## POLYMER ENGINEERING

### 9841:

- 601 POLYMER ENGINEERING SEMINAR** 1 credit  
Presentations of recent research on topics in polymer engineering by internal and external speakers.
- 611 STRUCTURAL CHARACTERIZATION OF POLYMERS WITH ELECTROMAGNETIC RADIATION** 2 credits  
Characterization of orientation, morphology, superstructure in polymers using x-ray, light scattering, birefringence, dichroism. Crystallography, unit cell determination.
- 621 RHEOLOGY OF POLYMERIC FLUIDS** 3 credits  
Experimental methods of determination of rheological properties of polymer melts, solutions, elastomers. Structure-flow behavior relationships, viscoelastic fluid theory, application to extrusion, fiber, film processing molding. Structure development in processing.
- 622 ANALYSIS AND DESIGN OF POLYMER PROCESSING OPERATIONS I** 3 credits  
Prerequisite: 621. Mathematical modeling and engineering design analysis of polymer processing operations including extruder screws, injection molds, dies, fibers, film formation.
- 623 ANALYSIS AND DESIGN OF POLYMER PROCESSING OPERATIONS II** 3 credits  
Prerequisite: permission of instructor. Basic studies on non-isothermal phenomena in polymer engineering emphasizing crystallization, vitrification, frozen-in orientation and residual stresses, applications, including fiber spinning and film extrusion.
- 631 ENGINEERING PROPERTIES OF SOLID POLYMERS** 2 credits  
Transitions as a function of polymer structure, optical characteristics, mechanical including ultimate properties, viscoelastic behavior of elastomers and plastics, large strain behavior E emphasis on experimental methods.
- 635 MECHANICAL STRENGTH OF POLYMERIC SOLIDS** 2 credits  
Extended chain crystal and theoretical strength of crystalline polymers, impact and high speed testing fatigue and long term testing, environmental stress cracking, statistical nature of failure, reinforcement and impact modification of thermoplastics, reinforcement of thermosets, reinforcement of elastomers.
- 641 POLYMERIC MATERIALS ENGINEERING SCIENCES** 2 credits  
Physico-chemical properties of amorphous and crystalline polymers. Glass transitions, crystallization, molecular orientation and morphology of important commercial polymers, fabricated products and composite materials.
- 642 ENGINEERING ASPECTS OF POLYMER COLLOIDS** 2 credits  
Thermodynamic properties of polymer colloids, sol-gel transformation, rheology of polymer solutions, gels, suspensions and emulsions, phase separation, applications to paints and plasters technology.
- 650 INTRODUCTION TO POLYMER ENGINEERING** 2 credits  
Basic concepts of polymer engineering taught in lecture-laboratory format intended for orientation of new graduate students.
- 651 POLYMER ENGINEERING LABORATORY** 2 credits  
Laboratory experiments on the rheological characterization of polymer melts fabrication of engineering products, structural investigation of polymeric parts.
- 661 POLYMERIZATION REACTOR ENGINEERING** 3 credits  
Polymerization kinetics, classical reactor design, comparison of polymerization in batch and continuous stirred tank reactors, flow patterns around agitators, tubular reactors, reactor stability.
- 699 MASTER'S THESIS** 1-6 credits  
(May be repeated) Supervised original research in specific area of polymer engineering.
- 711 ADVANCED ELECTROMAGNETIC AND OPTICAL PROPERTIES AND INVESTIGATIONS OF POLYMERS** 2 credits  
Maxwell's equations with application to anisotropic dielectrics, birefringence and dichroism and representation of orientation, optical instruments, piezoelectricity, scattering and diffraction of x-rays and light, Mie scattering, applications.
- 712 RHEO-OPTICS OF POLYMERS** 2 credits  
Applications of rheo-optical methods as means of determining stress fields in polymeric glasses and fluids during deformation, rheo-optical properties of polymers in glassy, rubbery and fluid states. Theory of dynamic birefringence and its application to mechanical relaxations of amorphous and semi-crystalline polymers, and recent experimental results.
- 713 RADIATION SCATTERING AND DIFFRACTION BY POLYMERIC MATERIALS** 2 credits  
Principles of scattering and diffraction theory as applied to polymer crystals, glasses and multiphase systems. Wide angle and small angle x-ray, light and neutron scattering, analysis and determination of crystal structures, mathematical description of orientation distribution of polymer and determination of orientation factors by WAXD and other methods.
- 716 NON-NEWTONIAN FLOW** 2 credits  
Prerequisite: 4200/600. Rheological behavior of non-Newtonian fluids. Development of fluid constitutive equations. Viscometric methods.
- 720 MOLECULAR ASPECTS OF POLYMER RHEOLOGY** 2 credits  
Prerequisite: 621 or permission of instructor. Molecular theory for concentrated solutions and melts of flexible homopolymers, molecular rheology of miscible polymer blends, block copolymers, and liquid crystalline polymers.
- 721 RHEOLOGY AND PROCESSING TWO-PHASE POLYMER SYSTEMS** 2 credits  
Prerequisite: 622 or equivalent. Particle-particle interactions, mixing devices and design, theoretical hydrodynamics of suspensions of rigid particles, experimental studies of rheological behavior, phenomenological theories representing suspension behavior, dispersion of droplets to form an emulsion, phase morphology development and rheological properties of blends.

- 722 ADVANCED MODELLING OF POLYMER PROCESSING** 2 credits  
Prerequisite: permission of instructor. Modelling of processing operations including extrusion molding, fiber and film processing, computer-aided design.
- 723 RHEOLOGY AND PROCESSING OF ELASTOMERS** 2 credits  
Interpretation of rheological properties and critical study and analysis of processing operations including behavior in internal mixers, screw extruders, die systems and vulcanization molding.
- 724 ADVANCED EXTRUSION AND COMPOUNDING** 2 credits  
Principles of operation and flow in single and twin screw extruders, screw design, characteristics of internal mixers, analysis and simulation of flow.
- 725 CHEMORHEOLOGY AND PROCESSING OF THERMOSETS** 2 credits  
Prerequisites: 621 or 622, or permission of instructor. Rheological behavior of thermosets, vulcanization of rubbers, time-temperature-transition relationships in thermosets, reaction injection molding, compression/transfer molding, pultrusion.
- 727 ADVANCED POLYMER RHEOLOGY** 2 credits  
Prerequisite: 621 or equivalent. Second level course in non-linear constitutive equation for viscoelastic, viscoplastic, viscoelastic-plastic polymeric materials. Utility and applicability to polymer processing problems.
- 731 STRESS ANALYSIS OF POLYMERS AND COMPOSITES** 2 credits  
Prerequisite: 631. The design of rubber mounts, bearings and sandwich components with demonstration of finite element methods. Classical plates and shells theories with applications to composite structures.
- 741 PHASE TRANSFORMATIONS IN POLYMERIC MATERIALS** 2 credits  
Prerequisite: permission of instructor. Thermodynamics, nucleation and kinetics of growth of new phases, spinodal decomposition and related mechanisms, crystallization, crystal-crystal transformation, stress induced crystallization.
- 743 POLYMER BLENDS AND ALLOYS** 2 credits  
Thermodynamics of miscibility and relationship to structure of components, compatibilizing agents, blending procedures, mechanical properties and structure-property relationships.
- 745 LIQUID CRYSTALS** 2 credits  
Prerequisite: permission of instructor. Structure of low molecular weight and polymeric liquid crystals, characterization, physical properties including optical properties, phase transitions, structure-property relationships, processing of polymeric species.
- 771 BLOW MOLDING AND THERMOFORMING** 2 credits  
Fundamentals of rubbery membrane heating and stretching. General blow molding and thermoforming concepts. Material structure-property development. Cooling and trimming to a final product.
- 797 ADVANCED TOPICS IN POLYMER ENGINEERING** 2-3 credits  
(May be repeated) Prerequisite: permission of instructor. Advanced special topics intended for Ph.D. students in polymer engineering.
- 898 PRELIMINARY RESEARCH** 1-15 credits  
(May be repeated) Prerequisites: completion of qualifying examination, approval of Student Advisory Committee. Preliminary investigation of Ph.D. dissertation subject.
- 899 DOCTORAL DISSERTATION** 1-15 credits  
(May be repeated) Prerequisite: completion of candidacy examination of Student Advisory Committee. Original research by a Ph.D. candidate.

## POLYMER SCIENCE

### 9871:

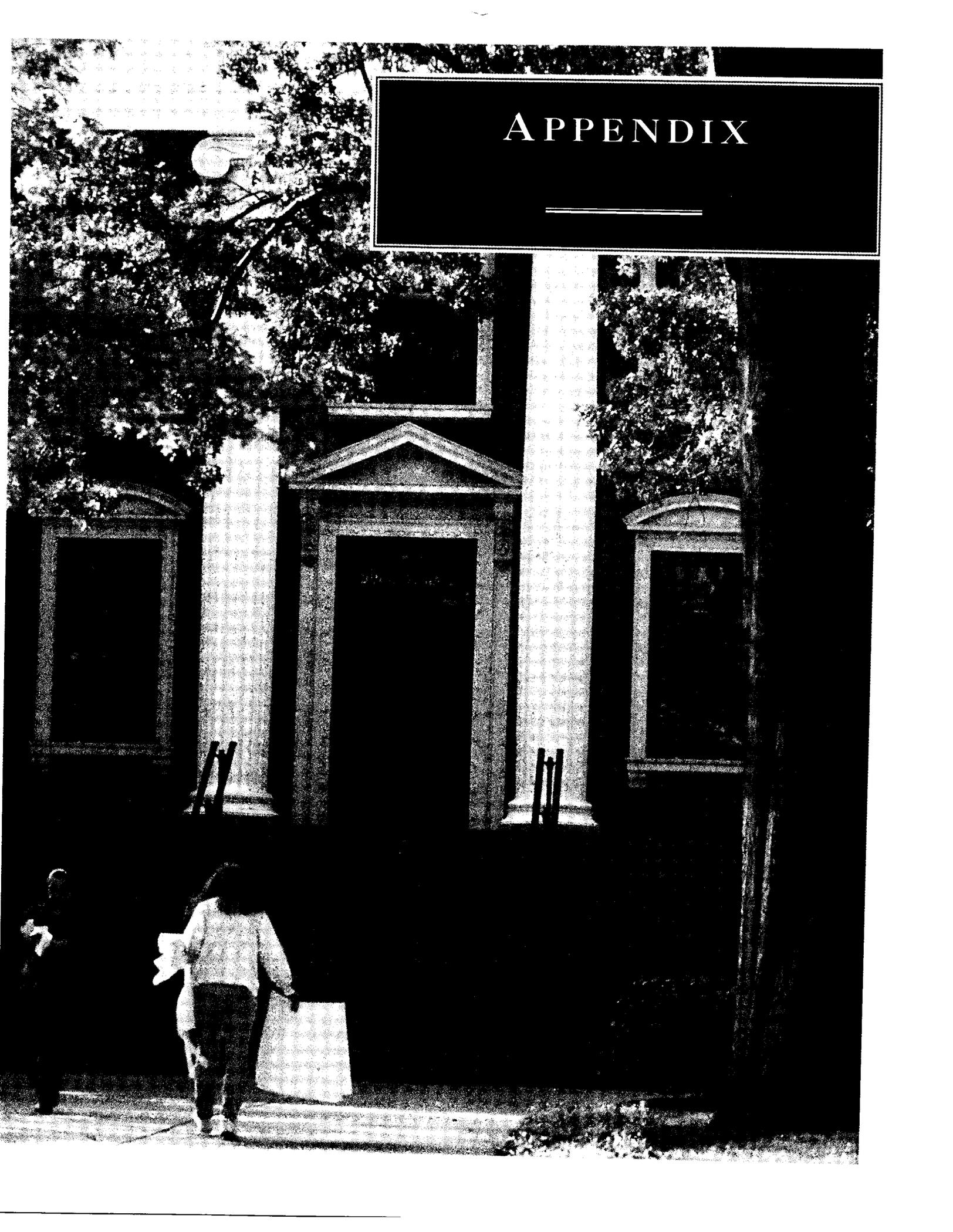
- 511 MOLECULAR STRUCTURE AND PHYSICAL PROPERTIES OF POLYMERS I** 3 credits  
Prerequisite: 301 or 302 or permission. Interdisciplinary course involving the principles of chemistry and physics are brought to bear on relationships between molecular structure and chemical composition of macromolecules and their physical properties.
- 512 MOLECULAR STRUCTURE AND PHYSICAL PROPERTIES OF POLYMERS II** 2 credits  
Prerequisite: 411/511 or permission. Mechanical characterization of polymeric materials, the Boltzmann superposition principle and fracture. Experimental techniques involving stress-strain behavior, stress relaxation, creep, forced and free vibrations discussed.
- 513 MOLECULAR STRUCTURE AND PHYSICAL PROPERTIES OF POLYMERS III** 2 credits  
Prerequisite: 412/512 or permission. Deformation of bounded rubber units, the correspondence principle, time-dependent failure, mechanical properties of polymeric foams and design considerations discussed.
- 590 WORKSHOP IN POLYMER SCIENCE** 1-3 credits  
(May be repeated with permission) Group studies on selected topics involving polymers. May not be used to meet undergraduate or graduate major requirements in polymer science. May be used for elective credit only.
- 601 POLYMER CONCEPTS** 2 credits  
Prerequisites: 3150/264 and 3150/314 or equivalent courses or permission of instructor. Introduction to basic concepts in polymer science, including polymerization, copolymerization processes and naturally occurring polymers. Polymer nomenclature, definitions and classifications. Polymer stereochemistry and structure-property relationships.
- 602 SYNTHESIS AND CHEMICAL BEHAVIOR OF POLYMERS** 2 credits  
Prerequisite: 601 or instructor's permission. Introduction to fundamentals and practical aspects of polymer synthesis and reactions of polymers; general knowledge of laboratory and commercial methods for polymer preparation; practical examples.
- 604 SPECIAL PROJECTS IN POLYMER SCIENCE** 1-3 credits  
Prerequisite: permission. Research projects of limited nature assigned to student entering polymer science program. Intended to familiarize student with typical problems and techniques in this field.
- 605 POLYMER CHEMISTRY LABORATORY** 2 credits  
Prerequisites: basic knowledge of organic chemistry and 602 or equivalent. The preparation and identification of polymers to illustrate different methods of polymerization such as step reactions and chain reaction.
- 607,8 POLYMER SCIENCE SEMINAR I AND II** 1 credit each  
Prerequisite: limited to first-and second-year resident graduate students. Participants are to present a 25-minute lecture on some aspect of polymer science and to participate in discussions of lectures presented by other seminar participants.
- 610 INORGANIC POLYMERS** 2 credits  
Prerequisite: 3150/472/572 or 3940/601 or permission. Survey course designed to broaden outlook of typical graduate student beyond chemistry and physics of carbon chains.

- 613 POLYMER SCIENCE LABORATORY** *3 credits*  
Prerequisites or corequisites: at least one of the courses 601, 631, 674, or 701, or permission of instructor. Laboratory experiments in synthesis, characterization, physical properties and processing and testing of polymers.
- 615 LABORATORY COMPUTER APPLICATIONS IN POLYMER SCIENCE** *3 credits*  
Prerequisites: Basic knowledge of computer programming and permission of instructor. Laboratory use of computers in polymer science research for data acquisition, data analysis, graphing, and preparation of reports and thesis.
- 631 PHYSICAL PROPERTIES OF POLYMERS I** *2 credits*  
Prerequisite: permission of instructor. Thermodynamic and molecular basis of rubber elastic behavior; time-dependent mechanical properties of polymeric materials; melt-flow and entanglements; the morphology of crystalline polymeric materials; fracture of polymers.
- 632 PHYSICAL PROPERTIES OF POLYMERS II** *2 credits*  
Prerequisite: 631 or permission of instructor. Normal-coordinate theories of molecular motion and applications to time-dependent mechanical, electrical, and scattering properties of polymeric systems; time-temperature superposition; free volume, WLF relation; fracture; glass transition.
- 649 SYNTHESIS AND TECHNOLOGY OF ELASTOMERS** *2 credits*  
Prerequisites: 3150:313 and 3150:314 or permission of instructor. The preparation of both natural and synthetic elastomers. Emphasis on polymerization methods, polymer structure and methods of vulcanization. The modification of vulcanizates and these effects on physical characteristics of the elastomers described.
- 674 POLYMER STRUCTURE AND CHARACTERIZATION** *2 credits*  
Prerequisites: 3150:313 and 3150:314 or permission of instructor. Presentation of statistical description of polymer molecular properties including chain polymerization and degradation, characterization of conformation, molecular weight, local structure, crystal structures and ordering.
- 675 POLYMER THERMODYNAMICS** *2 credits*  
Prerequisite: 674 or permission of instructor. Presentation of the theories and experiments concerning polymer solutions, polymer phase equilibria, and polymeric phase transitions and dilute solution steady-state transport.
- 676 POLYMER CHARACTERIZATION LABORATORY** *2 credits*  
Prerequisite: 675 or permission of instructor. Laboratory analysis of polymers by fractionation, osometry, swelling, x-ray diffraction, microscopy, thermal analysis, spectroscopy and chromatography.
- 680 POLYMER PROCESSING** *2 credits*  
Prerequisite: permission. Study of process engineering in polymer conversion industry, emphasizing analytical treatment of heat transfer, mass flow, mixing, shaping and molding of polymeric materials.
- 681 DESIGN OF RUBBER COMPONENTS** *2 credits*  
Prerequisite: 4600:337 or equivalent. Principles of design of elastomeric products, emphasizing analytical treatments of elastic behavior and mechanisms of failure of resilient mountings, springs, seats, bearings and tires.
- 699 MASTER'S THESIS** *1-6 credits*  
Prerequisite: permission. For properly qualified candidate for master's degree. Supervised original research in polymer science, under direction of faculty member, followed by submission of thesis.
- 701 POLYMER TECHNOLOGY I** *2 credits*  
Principles of compounding and testing, processing principles and types of operation, design principles.
- 702 POLYMER TECHNOLOGY II** *2 credits*  
Prerequisite: 701 or permission of instructor. Rubber industry, rubber compounding and processing, vulcanization methods, physical testing, plastics preparation and compounding, manufacturing processes. Lecture/laboratory.
- 703 POLYMER TECHNOLOGY III** *2 credits*  
Prerequisite: 702 or permission of instructor. Flow properties, extrusion, calendaring and milling, molding, mixing, bond operations, engineering properties, rubber springs, viscoelastic analysis design consideration. Lecture/laboratory.
- 704 CONDENSATION POLYMERIZATION** *2 credits*  
Prerequisite: 3150:463/563 or permission of instructor. Survey of the theory and practice of condensation polymerization. Numerous commercial examples are presented with special emphasis being placed on the properties and applications of polymers prepared by this technique. Structure-property relationships are highlighted for each major polymer class.
- 705 FREE RADICAL REACTIONS IN POLYMER SCIENCE** *2 credits*  
Prerequisite: 3140:463/563 or permission of instructor. Covers the kinetics and mechanisms of free radical initiated reactions encountered in polymer science, including polymerization methods, detailed considerations of the initiation, propagation and termination steps in vinyl polymerizations and copolymerization, preparation of block and graft copolymers by free radical initiated reactions and the mechanisms of free radical induced polymer degradation reactions.
- 706 IONIC AND MONOMER INSERTION REACTIONS** *2 credits*  
Prerequisite: 3150:463/563 or permission of instructor. Covers the scope, kinetics and mechanisms of polymerizations initiation by anions, carbenium ions and onium ions as well as polymerizations induced by coordination catalysts. Living polymerizations, molecular weights, molecular weight distributions, stereo-chemistry, solvent effects, counter-ion effects, temperature effects, Ziegler-Natta catalysis, olefin metathesis, functionalization of polymers, graft and block copolymer synthesis.
- 707 KINETICS OF POLYMERIC PROCESSES** *2 credits*  
Prerequisites: 632 and 675 or permission of instructor. Principles of kinetic theory and statistical mechanics are applied to a polymer diffusion, polymerization kinetics, polymer absorption, membrane transport, polymeric phase transformations, gel formation and colloidal destabilization.
- 708 MACROMOLECULAR CHAIN STRUCTURE** *3 credits*  
Prerequisites: either 3150:314, 3650:301, or 4200:305 or permission. Chain-like structure of large molecules, fundamental theories of chemical conformation and statistical mechanics developed to degree that their applications to polymeric problems can be discussed.
- 709 MACROMOLECULAR CHAIN STRUCTURE** *3 credits*  
Prerequisite: 708 or permission. Continuation of topics in 708 including experimental techniques used in elucidation of chain structure.
- 711 SPECIAL TOPICS: POLYMER SCIENCE** *1-3 credits*  
Prerequisite: permission. Topics of current interest in polymer science, encompassing chemistry, physics or technological aspects of macromolecular substances, including laboratory work where applicable.
- 712 SPECIAL TOPICS: POLYMER SCIENCE** *2 credits*  
Prerequisite: permission. Topics of current interest in polymer science, encompassing chemistry, physics or engineering aspects of macromolecular science.
- 713 CHAIN STRUCTURE LABORATORY** *2 credits*  
Prerequisite or corequisite: 708 or permission of instructor. Designed to apply principles discussed in 708 to laboratory determination of polymer structure.
- 899 DOCTORAL DISSERTATION** *1-16 credits*  
Open to properly qualified students accepted as candidates for Doctor of Philosophy in Polymer Science depending on the availability of staff and facilities.

# APPENDIX

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# Grievance Procedures for Graduate Students

## Purpose

The procedures set forth in this document are intended to provide graduate students with a formal channel of appeal and redress of grievances arising out of their academic and/or employment relationship with the University.

## Procedures

1. Any graduate student who believes that he or she has valid grounds for a complaint shall attempt to resolve the problem through a conference with the faculty member involved, the department head, and/or the graduate advisor. Following that, the student may attempt to resolve the problem with the assistance of the academic dean. A graduate student presenting a case to the academic dean must provide a full written statement of the grievance, together with all appropriate supporting material. When or if the problem has not been adequately solved at that level or the student wishes to appeal that decision, the student shall prepare a written statement of the complaint setting forth clearly and specifically the allegations and shall hand deliver the written complaint to the Dean of the Graduate School. The Dean of the Graduate School shall notify the complainant confirming the receipt of the complaint and shall request all materials from the Dean of the complainant's college.
2. Within one week of receipt of the complaint, the Dean of the Graduate School shall communicate with all parties in an attempt to informally resolve the problem. The result of this process will be a recommendation by the Dean of the Graduate School which will be communicated in writing to all parties, including the Senior Vice President and Provost.
3. The complaint shall become a grievance to be filed with the Senior Vice President and Provost if: 1) the Dean of the Graduate School wishes to have a Hearing Committee render a recommendation on the grievance; or 2) the student wishes to appeal the recommendation of the Dean of the Graduate School. The student must notify the Senior Vice President and Provost in writing within one week of notification of the Dean of the Graduate School's decision on the complaint.
4. Upon receipt of the grievance, the Senior Vice President and Provost shall notify in writing the President of Graduate Student Government that a Hearing Committee should be constituted. The Hearing Committee shall be organized in no more than two weeks.
5. When the grievance has been filed with the Chairperson of the Hearing Committee, it shall be the responsibility of that Chairperson to notify in writing all parties involved in the grievance within two working days. This notification shall include the following information: that a grievance has been filed; the nature of the grievance; and the parties involved.
6. If the charged party in that grievance admits the validity of the grievance, the Chairperson of the Hearing Committee shall waive the hearing and shall direct an appropriate resolution in consultation with the Hearing Committee.
7. If the party charged in the grievance denies the validity of the grievance, the Hearing Committee shall conduct the hearing.

## Hearing Committee

A Hearing Committee shall be established as follows:

1. **Chairperson** – The Chairperson shall be a member of the graduate faculty with full membership, but not from a department involved in the proceedings. This Chairperson shall be chosen at random from an established pool selected by the Graduate Council and shall serve for only one grievance proceeding. The Chairperson shall conduct the hearing and shall vote only in the case of a tie.
2. **Members** – Four members shall be selected as follows:
  - a. A graduate student not involved with the complainant and not from the complainant's department, selected jointly by the Department Chair and the President of the Graduate Student Government. If the grievance is filed against the Department Chair, the Academic Dean shall substitute for the Department Chair. If the grievance is filed against the department, the Senior Vice President and Provost shall substitute for the Department Chair.
  - b. A faculty member not involved with the complainant and not from the complainant's department, selected jointly by the Department Chair and the President of the Graduate Student Government. If the grievance is filed against the Department Chair, the Academic Dean shall substitute for the Department Head. If the grievance is filed against the department, the Senior Vice President and Provost shall substitute for the Department Chair.
  - c. A graduate student not involved with the complainant and not from the complainant's department, selected by the Vice Chairperson of the Graduate Council.

d. a member of the graduate faculty with full membership not involved in the complaint nor from the complainant's department, selected by the Senior Vice President and Provost.

3. A Hearing Committee shall be organized anew each and every time a grievance is brought forth. A Hearing Committee shall serve through the adjudication and resolution of the complaint.

## Hearing Procedure

1. The hearing must take place within two weeks of the Hearing Committee's formation.
2. At least three working days prior to the hearing, the Hearing Committee Chairperson shall provide the Hearing Committee and the Parties involved with:
  - a. The student's written statement of the grievance.
  - b. Written notification of when and where the Hearing Committee shall meet.
  - c. A copy of "Grievance Procedures for Graduate Students" and all relevant documents.
3. Each party shall be required to appear in person before the Hearing Committee to present his/her case. Each party may have an advisory/colleague present to protect his/her rights if so desired. However, the parties shall speak and act on their own behalf. Witnesses may be called to present evidence on behalf of the complainant or the charged person. The use of tape recorders is prohibited, except as may be required to accommodate persons with disabilities.
4. All parties shall be entitled to an expeditious hearing. In urgent cases in which it is alleged that a regulation, administration decision, or action threatens immediate and irreparable harm to any of the parties involved, the Hearing Committee shall expedite the hearing and disposition of the case. The Hearing Committee is empowered to recommend to the Dean of the Graduate School that an individual, department, or college discontinue or postpone any action which threatens to cause irreparable harm, pending the final disposition of the case.
5. The burden of proof shall be on the complainant and the standards of justice and fair play shall prevail in the adjudication of violations and grievances.
6. If necessary, the Hearing Committee may consult with the University's Office of General Counsel for advice at any time throughout this process.

## Decisions and Actions

1. The Hearing Committee shall decide as follows: there has been a violation of the complainant's rights, or there has been no violation of the complainant's rights.
2. Should the Hearing Committee determine that a violation of the complainant's rights occurred, the Committee shall, if practical, recommend a resolution to the Senior Vice President and Provost.
3. The Senior Vice President and Provost, exercising his/her judgment, shall act on the implementation of the resolution recommended by the Hearing Committee.

## Record Keeping

The Chairperson of the Hearing Committee shall be responsible for keeping a summarized, written record of all the proceedings.

1. Records of all proceedings shall be prepared by the secretarial personnel of the Graduate School. Copies of all proceedings shall be distributed as follows:
  - a. To all parties involved in the proceedings.
  - b. To the Hearing Committee members.
  - c. To the President of the Graduate Student Government.
  - d. To the Dean of the Graduate School.
  - e. To the Senior Vice President and Provost.
2. A copy of all proceedings shall be kept in the office of the Dean of the Graduate School pursuant to the University's record retention proposal.

## Appeal

An appeal may be made to the President of the University after all of the above procedures have been followed. The President of the University shall assess each case on an individual basis and his/her decision shall be considered final.

*Approved by Student Policy Committee, 2/2/93*

*Approved by Graduate Council, 3/29/93*

*Approved by Graduate Faculty, 4/22/93*

*Approved by the Academic Policies, Curriculum and Calendar Committee, 3/15/94*

*Approved by the Board of Trustees, 6/22/94*

*Revised Spring 1996 (Student Policy Committee and Graduate Council*

*Revisions Approved by Graduate Faculty, 4/25/96*

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## Intellectual Property Rights and Obligations

During your graduate study at The University of Akron and your professional career thereafter, you may become involved with at least one of the three main forms of intellectual property matters: copyrights, patents, and proprietary information/trade secrets. It is possible that certain discoveries may have commercial value, and therefore may invoke one or more of the above forms of intellectual property ownership.

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### Copyright

Copyright, by law, is automatically owned by the author or the authors, employer or sponsor when the work is placed in a fixed form (or medium). The University Board of Trustees automatically waives any claim of the University to copyright in books, texts, or articles of a purely academic nature authored by faculty or students except when the material is prepared as a sponsored project in which case it is the property of the University. Ownership would then be assigned to the University or its designee as the Board of Trustees directs. Questions of authorship are often best handled informally between potential joint authors.

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### Patents

All discoveries and inventions made by you while associated with The University of Akron must be reported to your faculty advisor, and through your advisor to your department chair, dean, and thereafter to the Office of Research Services and Sponsored Programs using the standard University of Akron invention disclosure form. This form provides a guide to describing and identifying the invention broadly and referencing specific results. Those persons thought to be possible inventors should also be identified on this form.

Patents on inventions made by University faculty, staff, students or anyone using University facilities are automatically owned by The University of Akron, as provided by Ohio Revised Code Section 3345.14. The final decision as to inventorship is a technical legal conclusion and will be made in the course of preparing a patent application by the patent attorney handling the application.

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### Proprietary Information

Those engaged in sponsored research may also be involved with developing or receiving proprietary information owned by others outside the University (e.g., sponsors such as corporations and individuals seeking certain research from the University). The University and the principal investigator may have agreed to maintain this proprietary information in confidence. In some situations, proprietary information of a sponsor may be provided to you or other project investigators during a research project. The sponsor desires, in these situations, to keep the information confidential (or secret) for as long as possible.

You are free to use the confidential information in the course of the project and discuss it with other students or faculty members engaged in that project. **However, you may not use the information on other projects, nor may you discuss it with other individuals not involved with that project.** While these commitments could delay public access to your thesis for a specified time, it will not delay acceptance or approval of your thesis/dissertation nor delay your graduation date.

The University and principal investigator must have written personal commitments from anyone working on a project involving and securing proprietary information. Therefore, all research students are required to execute the Confidentiality Agreement (sample form attached to this page). Prior to the start of your research, it is the responsibility of the research director to inform you in writing of any restrictions on the research with a copy also sent to the Office of Research Services and Sponsored Programs, if your research is subject to confidentiality provisions. You are also to be informed by the research director about the scope of the research that is covered by any confidentiality provisions.

If you have any questions as to what information is proprietary, seek guidance from your project's principal investigator or your faculty research advisor.

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## Questions of Authorship and Inventorship

In the event you think you have been improperly omitted from the list of authors, you should first discuss the matter with your faculty advisor. If you have further questions or consider the matter unresolved, you should inform in the following order the appropriate department chair, the college dean, and finally the Dean of the Graduate School. (Questions are usually, and most quickly, resolved at the lowest administrative levels.)

In the event you think you have been omitted as an inventor on a patent application, you should first discuss the matter with your faculty research advisor and, thereafter, with your department chair and finally with your academic dean. Following such consultations, either you and/or your faculty advisor, or your department chair, or your dean can request the patent attorney who prepared the application to recheck the findings and then prepare a formal report on inventorship. The whole patent application file may then be referred to the Office of General Counsel for a re-evaluation of valid inventors. However such as re-evaluation by patent counsel shall only occur with the prior knowledge of your faculty advisor, Department Chair and Dean.

(Sample)

## THE UNIVERSITY OF AKRON INVENTION PATENT AGREEMENT

Name: \_\_\_\_\_  
Last First Middle Initial

Social Security No.: \_\_\_\_\_

**The University of Akron graduate students are required to sign this form as a condition of being permitted to participate in any research activity at the University.**

1. As a condition of and in consideration of my participating in sponsored research or other financially supported activity at The University of Akron, I hereby agree to communicate fully with my Faculty Advisor, including discussing the details of any work conducted by me and the results which flow therefrom. I recognize that this communication is essential as it relates to any sponsored research, to any course and thesis/dissertation research, and to my safety and the safety of everyone else using the same facility that I use.

2. I further agree to disclose promptly to the director of the research and to my Faculty Research Advisor any invention conceived and/or reduced to practice by me whether jointly with others or solely, which results in whole or in part from such sponsored research or financially supported activity. I agree that I will comply with the provisions of any agreement between The University of Akron and any sponsor for any information and laboratory practice to which I am privileged to know. I will cooperate in assuring that the sponsor's rights, including rights in inventions, patents, copyrights, are fully protected. Further, I hereby assign all rights, title and interest to The University of Akron for its disposal at its sole discretion.

3. I also acknowledge that certain technical information that may arise as a result of the sponsored research or supported activity may be of a confidential nature. I agree to be bound to the reasonable terms of any nondisclosure agreement as it has been agreed to by the University.

4. Finally, I acknowledge and agree that any rights which arise as a result of the sponsored research or supported activity belong to The University of Akron or to the sponsor as determined by agreement between The University of Akron and the sponsor.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Student's Signature

## **Family Education Rights and Privacy Act (FERPA)**

### **A student has a right to:**

- Inspect and review education records pertaining to the student;
- Request an amendment to the student's records; and
- Request a hearing (if the request for an amendment is denied) to challenge the contents of the education records, on the grounds that the records are inaccurate, misleading, or violate the rights of the student.

### **The parent or eligible student has a right to:**

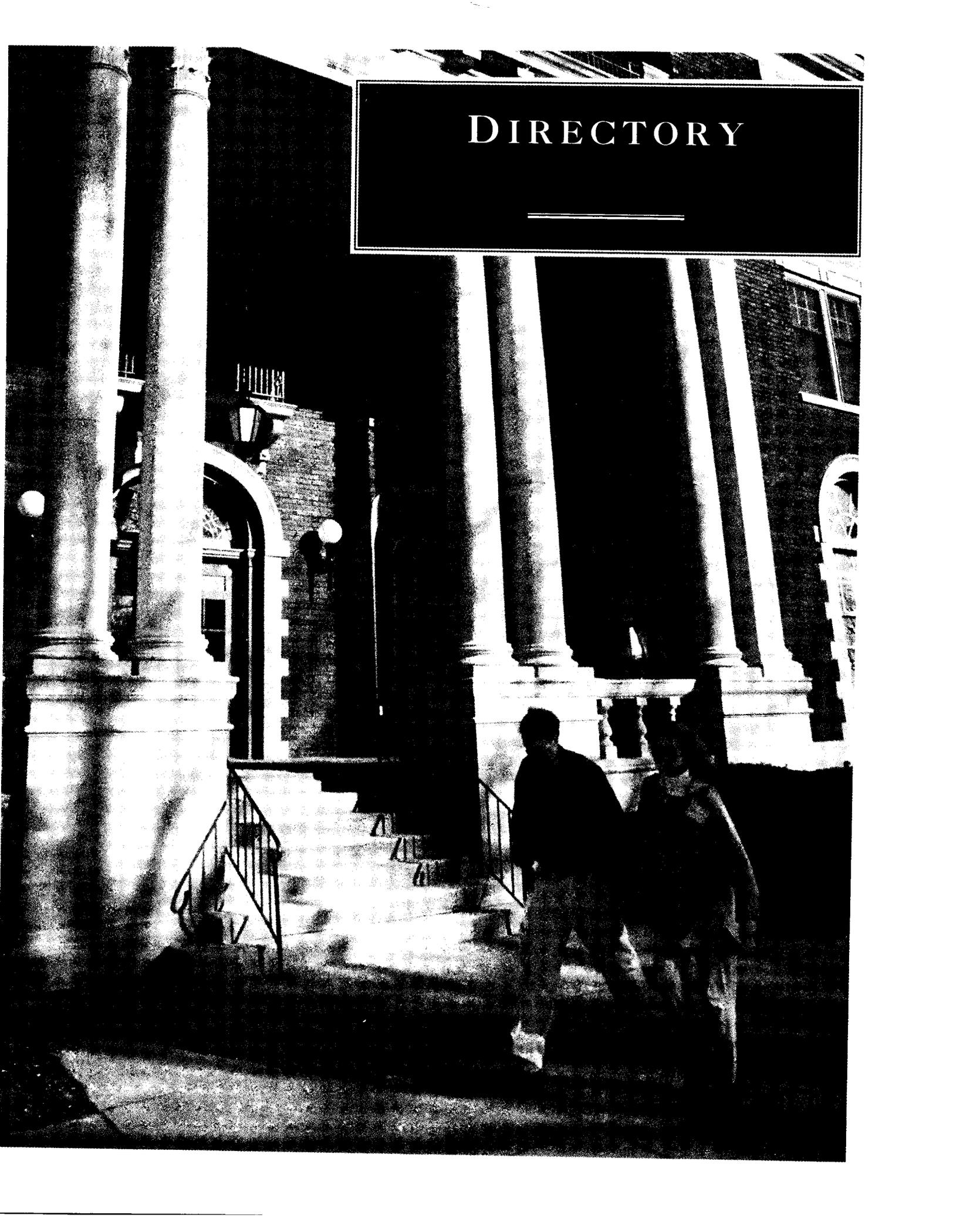
- Inspect and review the student's education records;
- Request the amendment of the student's education records to ensure they are not inaccurate, misleading, or in otherwise in violation of the student's privacy or other rights.
- Consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.
- File with the U.S. Department of Education a complaint concerning alleged failures by the school to comply with the requirements of FERPA; and
- Obtain a copy of the school's FERP policy.

### **Disclosure of Personally Identifiable Information**

- FERPA regulations list conditions under which "personally identifiable information" from a student's education record may be disclosed without the student's prior consent.
- Disclosure may be made to authorized representatives of the U.S. Department of Education, the Office of Inspector General, or state and local education authorities. These officials may have access to education records as a part of an audit or program review, or to ensure compliance with Student Financial Assistance program requirements. (Representatives of the Department include research firms that are under contract with the Department to conduct studies of financial aid procedures, using student information provided by the schools selected for the study. The term also includes the Student Financial Assistance program public inquiry contractor.)
- Disclosure may be made if it is in connection with financial aid that the student may receive a request from the Immigration and Naturalization Service (INS) or the Federal Bureau of Investigation (FBI) for access to a student's records. Such a request may be granted only if the student information is needed to determine the amount of the aid, the conditions for the aid, the student's eligibility for the aid, or to enforce the terms or conditions of the aid.
- Disclosure may be made to the student's parent, if the student is dependent on the parent, as defined by the Internal Revenue Service. If the student receives more than half of his or her support from the parent, under the IRS definition, the student is a dependent of the parent. (Note that the IRS definition is quite different from the rules governing dependency status for the Student Financial Assistance programs.)
- Disclosure may be made to organizations that are conducting studies concerning the administration of student aid programs on behalf of educational agencies or institutions.

# DIRECTORY

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**Board of Trustees****May 1997**

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**MR. DAVID E. (GENE) WADDELL**; 707 Society Building, Akron, Ohio 44308 (Term expires 2002).  
**MR. TIMOTHY S. HIGHAM** (student trustee); 1176 Duncan Spur, Akron, Ohio 44333 (Term expires 1998).

**Administrative Officers****September 1997****Administration**

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**Graduate Council****September 1997**

**CHARLES M. DYE**, Ph.D., *Dean of the Graduate School, Chair*

**Term expires August 31, 1998**

- THOMAS G. CALDERON**, Ph.D., *College of Business Administration*  
**THERESE L. LUECK**, Ph.D., *College of Fine and Applied Arts*  
**AMY MILSTED**, Ph.D., *College of Arts and Sciences: At-Large*  
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**PHILLIP H. SCHMIDT**, Ph.D., *College of Arts and Sciences: Natural Sciences*  
 ---, *President, Graduate Student Government*

**Term expires August 31, 1999**

- DOUGLAS R. KAHL**, Ph.D., *College of Business Administration*  
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 ---, *College of Engineering*  
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**Term expires August 31, 2000**

- WILLIAM T. BRANDY**, Ph.D., *College of Fine and Applied Arts*  
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**McKEE J. McKLENDON**, Ph.D., *College of Arts and Sciences: Social Sciences*  
**ROBERT J. VEILLETTE**, Ph.D., *College of Engineering*

**Graduate Faculty\*****September 1997**

- MARION A. RUEBEL**, *President of the University; Dean Emeritus of University College; Professor Emeritus of Education* (1970) (1996) (Ret. June 1994) B.A., M.A., University of Northern Iowa; Ph.D., Iowa State University, 1969.  
**MARION A. RUEBEL**, *President of the University; Professor of Education; Dean Emeritus of University College; Professor Emeritus of Education* (1970) (April 1996) (Ret. 1994) B.A., M.A., University of Northern Iowa; Ph.D., Iowa State University, 1969.  
**ABDULLAH ABONAMAH**, *Associate Professor of Mathematical Sciences* (1989) B.S., University of Dayton; M.S., Wright State University; Ph.D., Illinois Institute of Technology, 1986.  
**MARIA ADAMOWICZ-HARIASZ**, *Assistant Professor of Modern Languages* (1995) M.A., Maria Curie-Skłodowska University, Poland; M.A., Ph.D., University of Pennsylvania, 1994.  
**CAROLYN A. ALBANESE**, *Associate Professor of Home Economics and Family Ecology* (1978) B.S., Southern Illinois University at Carbondale; M.S., The Ohio State University, 1969.  
**M. KAY ALDERMAN**, *Professor of Education* (1979) B.S., University of Southern Mississippi; M.Ed., University of Texas at Austin; Ed.D., University of Houston, 1976.  
**TANA F. ALEXANDER**, *Associate Professor of Music* (1978) B.M., The Ohio State University; M.M., University of Louisville, 1974.  
**ALFRED L. ANDERSON**, *Professor of Music* (1985) B.M.E., Mississippi College; M.M., Indiana University, 1970.  
**CAROLYN M. ANDERSON**, *Assistant Professor of Communication* (1995) B.A., University of Detroit; M.A., Wayne State University; Ph.D., Kent State University, 1992.  
**WILLIAM B. ARBUCKLE**, *Associate Professor of Civil Engineering* (July 1982) B.S.Ch.E., Ohio University; M.S.E.E., Ph.D., University of North Carolina, 1975.  
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**JOHN J. ZARSKI**, Professor of Education; Director of the Clinic for Child Study and Family Therapy; Fellow, Institute for Life-Span Development and Gerontology (1985) B.S., Bloomsburg State College; M.A., University of Maryland; Ph.D., Ohio University, 1975.

**ROBERT S. ZOBEL**, Assistant Professor of Civil Engineering (January 1996) B.S.C.E., M.S.C.E., University of Florida, 1990.

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\*Deceased.

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**A. B. CHURCH\***, 1901-1912, D.D., LL.D.  
**PARKE R. KOLBE\***, 1913, Ph.D., LL.D.

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**WILLIAM V. MUSE**, 1984-1992, B.S., M.B.A., Ph.D.  
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**PEGGY GORDON ELLIOTT**, 1992-1996, B.A., M.S., Ed.D.  
**MARION A. RUEBEL**, 1996- B.A., M.A., Ph.D.

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**THOMAS SUMNER\***, 1960-1962, Ph.D.  
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**RANDY MOORE**, 1993-1995, Ph.D.  
**ROGER B. CREEL**, 1995-, Ph.D.

### College of Engineering

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**R. D. LONDON**, 1946-1963, C.E., M.S.  
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**NICHOLAS D. SYLVESTER**, 1989-1994, Ph.D.  
**CHIUO S. CHEN**, 1994-1995, Ph.D. (interim)  
**IRVING F. MILLER**, 1995-, Ph.D.

## College of Education

W. J. BANKES\*, 1921-1931, M.A.  
 ALBERT I. SPANTON\*, 1931-1933, M.A., Litt.D. (acting)  
 HOWARD R. EVANS\*, 1933-1942, Ph.D.  
 HJALMER W. DISTAD\*, 1942-1944, Ph.D. (acting)  
 HOWARD R. EVANS\*, 1944-1958, Ph.D.  
 D. J. GUZZETTA, 1958-1959, Ed.D. LL.D., D.S.Sc., L.H.D. (acting)  
 CHESTER T. McNERNEY, 1959-1966, Ph.D., LL.D.  
 H. KENNETH BARKER, 1966-1985, Ph.D.  
 JOHN S. WATT, 1985-1986, Ph.D. (acting)  
 CONSTANCE COOPER\*, 1986-1988, Ed.D.  
 JOHN S. WATT, 1988-1989, Ph.D. (acting)  
 WILLIAM E. KLINGELE, 1989-1996, Ed.D.  
 RITA S. SASLAW, 1996-, Ph.D. (interim)

## College of Business Administration

WARREN W. LEIGH\*, 1953-1962, Ph.D.  
 RICHARD C. REIDENBACH, 1962-1967, Ph.D.  
 ARTHUR K. BRINTALL, 1967-1968, Ph.D. (acting)  
 WILBUR EARLE BENSON\*, 1968-1970, Ph.D.  
 JAMES W. DUNLAP, 1970-1989, Ph.D.  
 RUSSELL J. PETERSEN, 1989-1994, Ph.D.  
 JAMES INMAN, 1994-1995, LL.M. (interim)  
 STEPHEN F. HALLAM, 1995-, Ph.D.

## School of Law

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 ALBERT S. RAKAS\*, 1979-1981, J.D. (interim)  
 DONALD M. JENKINS, 1981-1987, LL.M.  
 ISAAC C. HUNT, JR., 1987-1995, LL.B.  
 RICHARD L. AYNES, 1995-, J.D.

## Graduate School

CHARLES BULGER\*, 1933-1951, Ph.D., Litt.D. (Dean of Graduate Work)  
 ERNEST H. CHERRINGTON, JR., 1955-1960, Ph.D. (Director of Graduate Studies)  
 ERNEST H. CHERRINGTON, JR., 1960-1967, Ph.D. (Dean of the Graduate Division)  
 ARTHUR K. BRINTALL, 1967-1968, Ph.D. (Dean of Graduate Studies and Research)  
 EDWIN L. LIVELY, 1968-1974, Ph.D. (Dean of Graduate Studies and Research)  
 CLAIBOURNE E. GRIFFIN\*, 1974-1977, Ph.D. (Dean of Graduate Studies and Research)  
 JOSEPH M. WALTON, 1977-1978, Ph.D. (Associate Dean of Graduate Studies and Research)  
 ALAN N. GENT, 1978-1986, Ph.D. (Dean of Graduate Studies and Research)  
 JOSEPH M. WALTON, 1986-1989, Ph.D. (Acting Dean of Graduate Studies and Research)  
 PATRICIA L. CARRELL, 1989-1993, Ph.D. (Dean of the Graduate School)  
 CHARLES M. DYE, 1993-, Ph.D. (Dean of the Graduate School)

## University College (formerly General College)

D. J. GUZZETTA, 1959-1962, Ed.D., LL.D., D.S.Sc., L.H.D.  
 THOMAS SUMNER\*, 1962-1977, Ph.D.  
 PAUL S. WINGARD, 1977-1978, Ph.D. (acting)  
 MARION A. RUEBEL, 1978-1989, Ph.D.  
 NANCY K. GRANT, 1989-1990, Ph.D. (acting)  
 THOMAS J. VUKOVICH, 1990-1993, Ph.D. (acting)  
 KARLA T. MUGLER, 1993-, Ph.D.

## Evening College

L. L. HOLMES, 1932-1934, M.A. (director)  
 LESLIE P. HARDY\*, 1934-1953, M.S.Ed., L.H.D. (director)  
 E. D. DURYEY, 1953-1956, Ed.D. (dean)  
 D. J. GUZZETTA, 1956-1959, Ed.D., LL.D., D.S.Sc., L.H.D. (dean)  
 WILLIAM A. ROGERS, 1959-1967, Ed.D. (dean)  
 CHARLES V. BLAIR, 1967-1970, M.A. (dean)  
 JOHN G. HEDRICK, 1970-1974, M.A. (dean)  
 CAESAR A. CARRINO, 1974-1986, Ph.D. (dean)

## Community and Technical College

W. M. PETRY\*, 1964-1974, M.S.M.E.  
 ROBERT C. WEYRICK, 1974-1985, M.S.  
 FREDERICK J. STURM, 1985-1987, Ed.D. (acting)  
 JAMES P. LONG, 1987-1989, Ph.D.  
 FREDERICK J. STURM, 1990-1995, Ed.D.  
 DEBORAH S. WEBER, 1995-1996, M.A. (interim)  
 DAVID SAM, 1996-, Ph.D.

## College of Fine and Applied Arts

RAY H. SANDEFUR\*, 1967-1978, Ph.D.  
 GERARD L. KNIETER, 1978-1986, Ph.D.  
 KELVIE C. COMER, 1986-1987, Ed.D. (acting)  
 WALLACE T. WILLIAMS\*, 1987-1991, Ph.D.  
 DONALD E. HALL, 1991-1992, Ph.D. (acting)  
 LINDA L. MOORE, 1992-, Ph.D.

## College of Nursing

ESTELLE B. NAES, 1967-1975, Ph.D.  
 LILLIAN J. DeYOUNG, 1975-1988, Ph.D.  
 ELIZABETH J. MARTIN, 1988-1992, Ph.D.  
 V. RUTH GRAY, 1992-1996, Ed.D.  
 JANNE R. DUNHAM-TAYLOR, 1996-1997, Ph.D. (interim)  
 CYNTHIA F. CAPERS, 1997-, Ph.D.

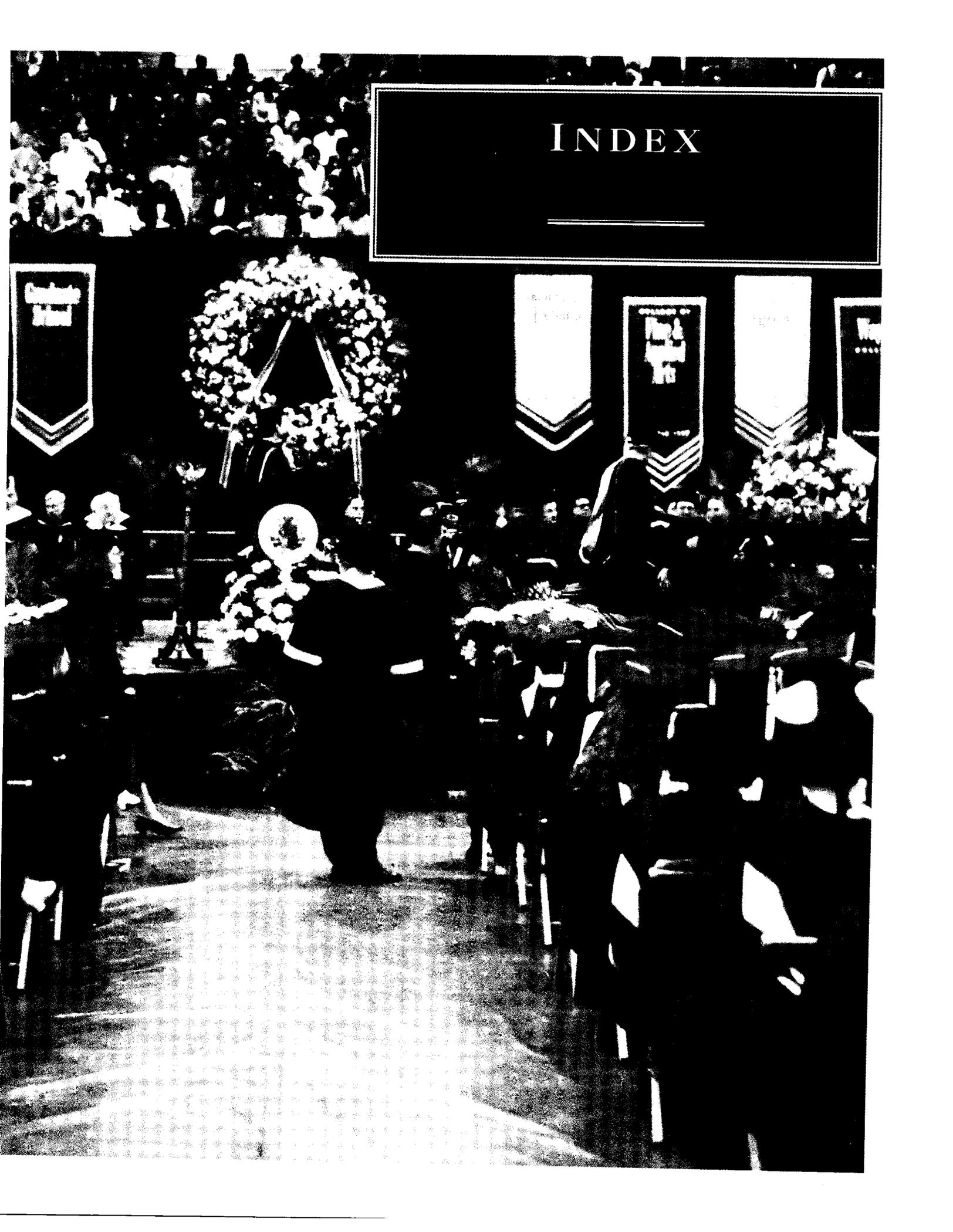
## Wayne College

MARVIN E. PHILLIPS, 1972-1974, M.A. (acting director)  
 JOHN G. HEDRICK, 1974-1974, M.A. (director)  
 JOHN G. HEDRICK, 1974-1979, M.A. (dean)  
 ROBERT L. McELWEE, 1979-1980, M.A. (acting dean)  
 TYRONE M. TURNING, 1980-1995, Ed.D. (dean)  
 FREDERICK J. STURM, 1995-1997, Ed.D. (dean)  
 JOHN P. KRISTOFKO, 1997-, Ph.D. (dean)

## College of Polymer Science and Polymer Engineering

FRANK N. KELLEY, 1988-, Ph.D. (dean)

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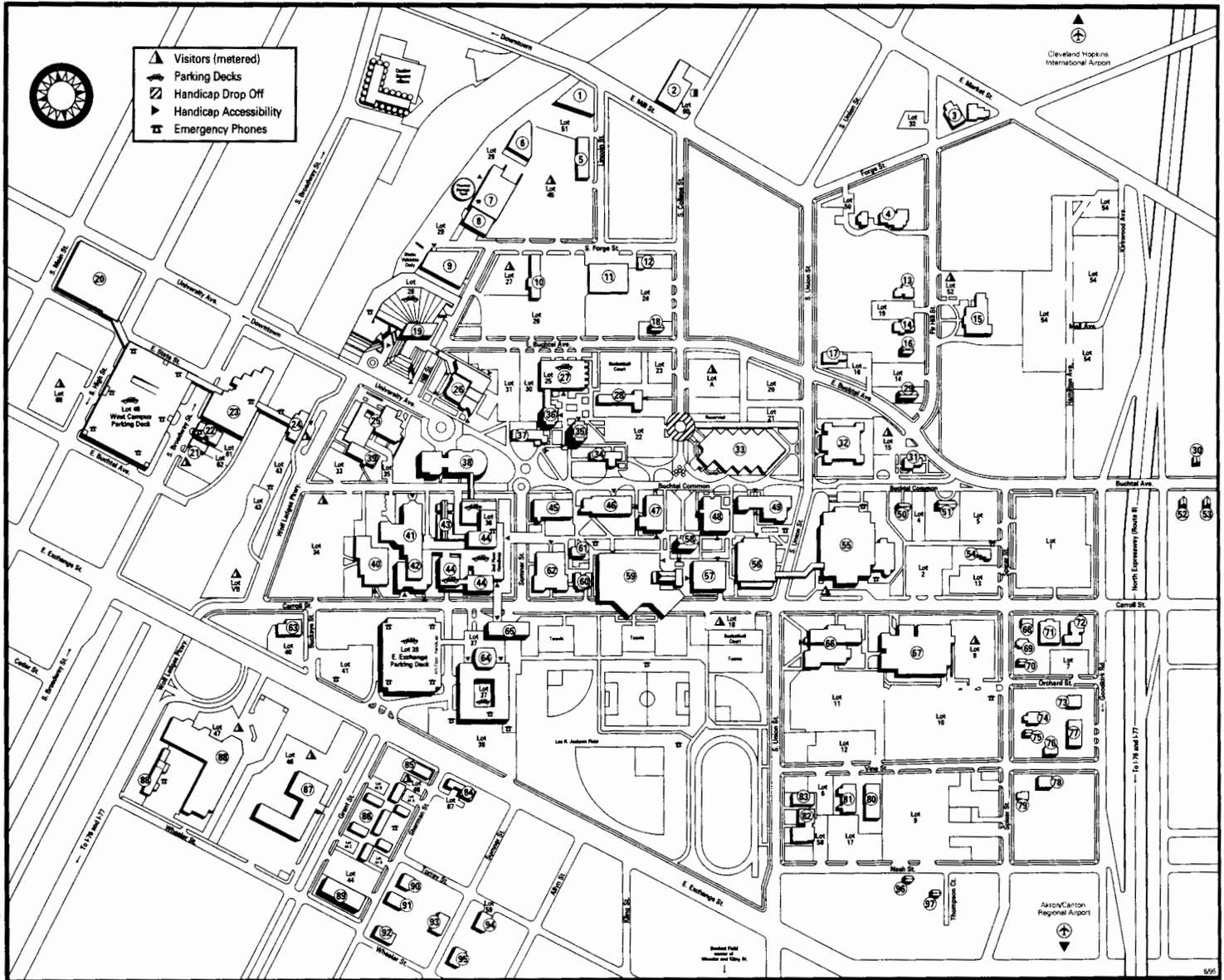
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 Neil M. Russell, Title IX Coordinator  
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# CAMPUS MAP

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# THE UNIVERSITY OF AKRON CAMPUS MAP



LOCATOR	BLDG NO.	LOCATOR	BLDG NO.	LOCATOR	BLDG NO.	LOCATOR	BLDG NO.
<b>ACADEMIC BUILDINGS</b>				<b>ADMINISTRATIVE BUILDINGS</b>			
E5	44	I5	31	H6	55	J5	54
G1	2	F1	1	F4	27	J7	74
E5	45	F6	60	D3	19	K5	52
I1	3	B4	21	<b>RESIDENCE HALLS, FRATERNITIES ANDSORORITIES</b>			
G5	33	B4	22	J8	79	F5	34
G6	57	G5	58	J6	68	D9	91
B4	23	C6	63	J6	69	I9	97
F5	46	F3	11	F3	18	J6	71
B8	88	D6	40	K7	77	I9	96
F3	12	D7	85	H8	82	E4	37
D6	42	E8	84	F4	35	E4	36
D4	26	I4	29	J7	75	D9	93
D5	41	E2	8	D9	90	I3	16
H5	49	E1	6	I5	51	J7	76
G5	48	F2	5	K5	30	D8	86
D4	25	E3	10	D9	92	K5	53
H4	32	D3	9	C8	87	H8	83
E2	7	H6	66	<b>MULTI-PURPOSE BUILDINGS</b>			
A3	20	H4	17	C4	24	H8	80
E5	38					E9	94
E6	65	I3	14	I3	14	K7	73
E7	64	F5	61	C9	89	C9	89
E6	62	F6	59	H8	81	D9	95
C4	39	F4	27	J7	70	I3	13
D5	43	I2	4	I3	13	F4	28
F5	47	J3	15				
		G6	58				
		I7	67				

\* Privately owned residence halls