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Calendar 1994-1995

Fall Semester 1994

Day and Evening Classes Begin  Mon., Aug. 29
*Labor Day  Mon., Sept. 5
Veterans Day (classes held; staff holiday)  Fri., Nov. 11
**Thanksgiving Break  Thurs.-Sat., Nov. 24-26
Classes Resume  Mon., Nov. 28
Final Instructional Day  Sat., Dec. 10
Final Examination Period  Mon.-Sat., Dec. 12-17
Commencement  Sat. Dec. 17
Spring Intersession  Mon.-Fri., Jan. 2-13

Spring Semester 1995

*Martin Luther King Day  Mon., Jan. 16
Day and Evening Classes Begin  Tues., Jan. 17
*Presidents' Day  Mon., Feb. 21
Spring Break  Mon.-Sat., March 20-25
***May Day  Fri., May 5
Final Instructional Day  Sat., May 6
Final Examination Period  Mon.-Sat., May 8-13
Commencement  Sat., May 13
Summer Intersession  Mon.-Fri., May 15-June 9
Commencement for Law School  Sat., May 20

Summer Session I 1995

First 5- and 8-Week Sessions Begin  Mon., June 12
*Independence Day  Tues., July 4
First 5-Week Session Ends  Fri., July 14

Summer Session II 1995

Second 5-Week Session Begins  Mon., July 17
8-Week Session Ends  Fri., Aug. 4
Second 5-Week Session Ends  Fri., Aug. 18

Fall Semester 1995

Day and Evening Classes Begin Mon., Aug. 28

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, 166 Fir Hill, Akron, OH 44325. (216) 972-7100.

Inquiries

Address inquiries concerning:

Graduate study to the Graduate School, Fir Hill Center, (216) 972-7663.
Admissions information, campus tours, and housing, transfer of credits to the Office of Admissions, 166 Fir Hill, (216) 972-7100.
Financial aid, scholarships, loans, and student employment to the Office of Student Financial Aid and Employment, Spicer Hall, (216) 972-7032.
Athletics to the Athletic Director, James A. Rhodes Health and Physical Education Building, (216) 972-7080.
Registration, scheduling, residency requirements, and veteran's affairs to the Office of the Registrar, Spicer Hall, (216) 972-7044.

The University of Akron switchboard number is (216) 972-7111.
The University of Akron, Akron, OH 44325

University Closing Policy

The president or designee 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. Appropriate University officials and area media will be notified when such a decision is made. University colleges/departments are encouraged to establish a method for communicating the closing decision to departmental personnel. Closing information will be announced as clearly and simply as possible to avoid confusion.

Cancelling of classes and closure announcements will be made as early as possible in the day and will clearly state the affected campuses.

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.
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 present standing as a major urban research 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 cements, 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 185 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 (1925), 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 1919. From those first classes in Professor Charles W. Knight's laboratory would evolve the world's first College of Polymer Science and Polymer Engineering (1948), now the largest academic polymer program in the world. In the 1930s and 1940s, with the establishment in Akron of the Guggenheim Airframe Institute, UA faculty studied the structure and design of zeppelins, and 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 attracts 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, poetry, choreography dance works, they explicate 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 1960s, 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 "new majority" 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 science in 1956, but many more degrees were granted as early as 1972. Doctoral work has now expanded to programs leading to the highest academic degree in 18 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, over 28,000 students from 36 states and 89 foreign countries are enrolled in its 10 degree-granting units. The University of Akron is the 48th-largest in the nation and boasts the third-largest-man-campus enrollment of any university in Ohio. The university offers a comprehensive academic package featuring select programs unsurpassed nationally and internationally. Alumni of the University number more than 97,000 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 main campus with 77 modern buildings is within walking distance of downtown Akron and is located in a metropolitan area of 1.5 million people. The University's presence in Northeast Ohio provides numerous opportunities in research for its college, amateur, and professional sports, 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 college on the hill has been an integral part of the city whose name it bears, an active participant in Akron's renaissance of commercial and artistic endeavor; leader in the city's intellectual and professional advancement; a center for internationally lauded research efforts; a source of enrichment education, and vital both for itself and for its community. 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, our world.

The Campus

During recent years, the University campus has undergone many major changes. In 1963 the University's 13 acres encompassed only 10 buildings. Currently the Akron campus covers 179 acres and includes 77 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 Buchtel Avenue and Canal Street in the downtown area. For air-line 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:

Admission Building: This office is located at 351 Buchtel Common. The Office of Admissions assists students with applications, requirements, and procedures for undergraduate, postbaccalaureate, guest, transfer, auditing, or special student status.

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, 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 and for physics.

Ballet Center. This center, located at 354 East Market Street, houses dance studios, a moseography laboratory, faculty offices, studios, 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.
and rebuilt in African-American history. The building also serves as temporary quarters for the Adult Resource Center.

Buchtel tration, the George W. Daverio School of Accountancy, and the departments of University's link with its predecessor, Buchtel numerous administrative officials of the University.

at 185 industrialist and dedicated member of the University Board of Trustees from 1952 productions, the Firestone Conservatory.

Gallucci Hall. which serves as a unifying force in the life was constructed which cost more than $13.9 million. This building, at 171 South Forge Street houses the University's link with its predecessor, Buchtel

312. This building at 185 Buchtel Street houses the University's Information Services offices, main computers, and workrooms, as well as student and faculty microcomputer labs and time-sharing terminals.

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

This facility was promoted to vice president. He retired in 1962. This facility, stands-at the corner of University Avenue and Wolf Ledges Parkway.

This building at 171 South Forge Street 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.

This building currently houses the Purchasing and 'Telecommunications department offices and Information Services' voice and cable communications group.

This former Girl Scout regional headquarters building has been renovated to accommodate the local luxury nursery college.

This building at 146 Hill Street, is adjacent to E. J. Thomas Hall and houses physical facilities offices and craft shops, the central heating and cooling distribution center, and the Campus Police/Security Department.

This building at 70 University Avenue, houses offices for the dean of the 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.

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.

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

This 10 million complex is named in honor of Dr. Charles E. Hower, who taught the first courses in rubber technology at Buchtel College as early as 1909. Opened in 1979, the building houses the Department of Chemistry and features numerous innovative laboratories with the latest, most sophisticated safety equipment, along with classrooms and faculty and administrative offices.

identified by its colonnade arch, this complex was named for the first president of the Municipal University of Akron, Parker R. Kolbe. It houses the University Theatre, the Center for Community and Public Television, and classrooms.

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 (dur­ ing the 1993-94 Kolbe Hall, Phase I Construction Project).

Paul E. Martin University Center. Located at 105 Fir Hill, the Paul E. Martin Uni­ versity 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 func­ tions, banquet, receptions, and parties can be scheduled during the hours of 7:30 a.m. to noon. The departments of Alumni Relations and Development are locat­ ed on the upper floors of the building.

McDowell Law Center. Named for C. Blake McDowell, prominent local attor­ ney, 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, most courtroom, apprentice-review office, seminar rooms, and facul­ ty offices. A $2.6 million addition provides library and support space, and a $1.5 million expansion has linked McDowell Law Center to West Hall, provid­ ing additional administration office space. The law complex stands at the corner of University Avenue and Wolf Ledges Parkway.

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 Lan­ guages, 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 (Industrial Incubator). This building currently houses the Purchasing and 'Telecommunications department offices and Information Services' voice and cable communications group.

108 Fir Hill. This former Girl Scout regional headquarters building has been reno­ vated to accommodate the local luxury nursery college.

143 Union Street Building (Newman Center). This recently purchased building provides administrative office space for the University treasurer, budget director, the payroll department, and Information Services' network services group.

Olson Research Center. This renovated 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, is adjacent to E. J. Thomas Hall and houses physical facilities offices and craft shops, the central heating and cooling distribution center, and the Campus Police/Security Department.

The Polasky Building. The largest academic building in Ohio, this renovated downtown department store is home to all of the Community and Technical Col­ lege except the Engineering and Science Technology Division, plus University Archives, the Archives of the History of American Psychology, the School of Com­ munication Disorders, the Parke 111.Govan and Parke 111.B. McDowell Centres, the Department of Pub­ lic Administration and Urban Studies, the Center for Urban Studies, the School of Social Work, Continuing Education programs, and a temporary food court on the Main Street level (first floor). A permanent food court is planned for the High Street level.

Polymer Science Building. Construction of the $17 million Polymer Science Build­ ing is expected to be 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 Col­ lege of Polymer Science and Polymer Engineering and the American Chemical Society. The building includes a 200-seat lecture hall and offices, classrooms, and research laboratories for the College of Polymer Science and Engineering.

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

Background Information
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, press boxes, 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 offices 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 Hezekiel 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 Career Center in this facility.

Spicer Hall. This major student services building, renovated in 1975, houses the Registrar's Office, Academic Advisement Center, the Office of Student Financial Aid, University College, the Office of Services for Students with Disabilities, the parking systems office, and offices for the University controller, accounts payable and receivable, and the state examiner.

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. Houses 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 280, general classrooms, a handicrafts room, a teaching demonstration classroom, a microteaching laboratory, educational media lab, and the Student Teaching Office.

**FACILITIES AND EQUIPMENT**

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.

**Information Services**

The Department of Information Services is responsible for computing, network services, and telecommunications throughout the campus. The department is made up of three sections: Academic User Services provides computing support to academic research and instructional efforts. Networking Services provides support for all of the University's voice and data communications and networking, and Computer Services provides the mainframe hardware and software support for the University as well as applications development support for the University's administrative business. The major portion of the department is located in the Computer Center at the west end of the central campus with portions of the networking and telecommunications groups located in the Union Building, the Lincoln Building, and Carroll Hall.

The Academic User Services section of Information Services provides support for academic and instructional computing and assists the student and faculty member in making effective use of the computer Center. This section supports the acquisition and implementation of packaged programs for specific department and provides consultation on problems requiring numerical analysis. The Computer Based Education and Testing (CBET) group within the Academic User Services section develops and/or acquires specialized instructional programs. Many of these programs are suitable for independent study in nature and are designed to assist the student in learning a particular idea or principle. The CBET group also supports the Testing Center, which provides the capability for students to take course tests via a computer.

For mainframe computing, Information Services utilizes an IBM 4381-R14 running VM/SP as the operating system and an IBM 3090-200 dyadic processor running MVS/VA. The IBM 4381-R14 is used by faculty and students for interactive computing and allows academic users to submit batch jobs to the IBM 3090-200 over a channel-to-channel adapter. The IBM 3090-200, in addition to being a shared processor for academic and administrative batch computing and interactive interactive computing, has a vector processor that does parallel processing in support of academic supercomputing. In addition to the two IBM machines, there is a DECSystem 5000/240 running Ultrix that is primarily used by Computer Science and Engineering.

The library has two Digital processors on the Computer Center platform, a DEC-system 5000/240 and a DECSystem 5000. Both processors are running the Innovative Interfaces Inc. library system and are part of the Ohio Library Information Network (OhioLINK)

All of the mainframe computers as well as many of the campus's microcomputers, faculty members' offices, and administrative offices are connected via Zebra Transmission Protocol network (ZTPnet). This is a high-speed data network available across campus which has a connection to CARNET, the statewide network. It provides access to the University, the nationwide network, and the Ohio Supercomputer Center in Columbus.

Primary access to the mainframe computers is by work stations utilizing ZTPnet or by remote terminals. The peripheral equipment attached to the mainframes includes high-speed laser and impact printers, high-capacity disk drives, magnetic tape drives, a microfiche printer, and a voice-response system used for telephone registration. Plotting is supported using either a CalComp Pen Plotter or a CalComp Drawingmaster. An NCs Cpscan 21-75 Optical Mark Sensi Reader scans mark sense forms providing fast and reliable data entry for test scoring services, surveys, faculty evaluations, and payroll time cards. Information Services also supports widely used computer languages such as FORTRAN, C, COBOL, PL/1, BASIC, PASCAL, SAS, SPSS, and APL, and microcomputer packages such as Lotus, WordPerfect, dBase, and Harvard Graphics.

**Student Services**

**COUNSELING AND TESTING CENTER**

In addition to participating with the Career Center in the Career Development Service, the Counseling and Testing Center provides a wide range of psychological counseling, therapy, testing, and outreach and consulting services to the University community. The Center is located in 163 Simmons Hall, phone: 972-7082.

**Counseling Service**

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

- 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.
- Person-environment counseling deals with short-term counseling, welfare, loneliness, inadequacy, guilt, anxiety, 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 cover a wide range of topics which typically deal with improving grades, reducing test anxiety, planning careers, increasing effectiveness, and addressing personal issues; as well as providing support groups for minority students and others with a variety of concerns. Brochures are available.

**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. Topic areas include academic performance, wellness, sexuality, and appreciating cultural diversity.

The Center's staff is also available for consultation and advice in understanding individual or group behavior using psychological theory and principles. In addition, the Center provides appropriate referral sources for social, psychological, and medical services.

**Testing Service**

The Center's testing service offers a variety of testing programs including learning disability determination, advanced placement testing for college credit (CLEP), placement testing in mathematics and foreign language, and national testing programs. National testing includes pre-college tests (ACT, SAT, and GATS), pregraduation school tests (Millers Analog Test, LSAT, GRE) and Education certification tests (PPST and NTE).

Individual psychological and career assessment is offered in conjunction with counseling. Tests cover such areas as vocational interests, aptitudes, achievement, personality, and assessment of psychological problems.
STUDENT HEALTH SERVICES

Health service facilities are located in Robertson Dining Hall, immediately adjacent to the residence halls. This facility is capable of handling most acute illnesses and injuries. Sick call hours are 9:00 to 11:30 a.m. and 1:00 to 2:30 p.m., and 6:00 to 7:00 p.m. most evenings (call first for evening service).

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 a student 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 health insurance program, available through the University's insurance service, offers coverage for such items as hospitalization, surgical benefits, and in-hospital medical benefits.

To identify existing or potential health problems, a Health History Profile form and Immunization Record form are included in the packet containing other admission forms and information. Explanations for completion and mailing of this form are included. Completion of this form is essential.

The completed health form and other health-related records are treated as confidential and are kept in the Student Health Services offices.

UNIVERSITY LIBRARIES

Library facilities are houses in three separate locations: in Bierce Library on Buchtel Boulevard, the Science Library is in Auburn Science and Engineering Center, Room 104; and Archival Services is in the Folksy 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. Archival Services collects and makes available materials which have historical or other research interest and which relate primarily to The University of Akron, to an eight-county region in Northeast Ohio, or to American psychology.

The University Libraries' collections contain more than 2.8 million items: books, periodicals, government documents, curricular materials, microforms, maps, audiovisual materials, and archival documents. The library receives nearly 5,000 volumes, journals, newspapers, and other serial publications, as well 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 available in Bierce Library.

Audio-Visual Services, located in Bierce Library, Room 638, maintains an extensive centrally cataloged collection of audio-visual resources for students and faculty use. It also has a collection of instructional materials in various media formats (filmstrips, slides, etc.) to supplement class-room instruction.

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 by 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 five-hour and half-day programs for children three to five years old. Full-day sessions are available year round for children two-and-half to five years old.

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

For more information call the Center for Child Development, (216) 972-7760.

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 Chickery features the services of a fast-food operation, a pizzeria, and a Mexican shop, and an ice cream and yogurt shop. For more of a cafeteria-style setting, the Hilltop, on the second level, provides full meals, a salad bar, soup, and a variety of sides.

• Gardner Theatre operates Tuesday through Sunday with two showings of first-run movies each day.

• 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, (216) 972-6894, sells tickets to most events in northern Ohio, including Blossom Music Center, the Coliseum, IX Center, Playhouse Square, Public Hall, and the Stadium. 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 226 other college Bookstores. The primary function 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.

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 in the Division of Student Affairs. It is the responsibility of this office to provide students with disabilities the necessary services that will ensure them 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, (216) 972-7929 (TDD/Voice).

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:

3300-220 English Literature

In the above example, the first four digits of the number (3300) indicate the college and department. In the case, 3300 represents the Buchtel College of Arts and Sciences. 3300 refers to the Department of English. The second set of digits (220) 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:

100-199 First-year-level courses
200-299 Second-year-level courses
300-399 Third-year-level courses
400-499 Fourth-year-level courses
500-699 Master's-level courses
700-799 J.D.-level courses
800-899 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.
Graduate School

Charles M. Dye, Ph.D., Interim Dean
Lathardus Goggins, Ph.D., Associate Dean

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. Brintnell was appointed dean of Graduate Studies and Research in 1967, being succeeded in 1969 by Dr. Edwin L. Lively, Dr. Clbourne 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 1986 Dr. Patricia L. Carroll became dean of the Graduate School. Dr. Charles M. Dye was named interim dean in 1993.

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, history, polymer sciences, psychology, sociology, urban studies, education (elementary, secondary and guidance and counseling) and engineering. 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: accounting, biology, business administration (accounting, finance, international business, management, marketing and taxation), chemical engineering, chemistry, civil engineering, communicative disorders, earth science, economics, education (educational foundations, elementary, secondary, multicultural education, physical education, elementary or secondary school principal, school supervisor, local superintendent, counseling, special education), English (writing teacher, reading specialist, school psychologist, educational engineering, engineering, English, geography, history, home economics and family ecology, management, communication, mathematics, mechanical engineering, music, nursing, philosophy, physics, political science, polymer engineering, psychology, public administration, sociology, Spanish, speech, statistics, technical education, theatre arts and urban studies. 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.

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 counseiling the dean in administrative matters.

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. GSG also sponsors numerous social events, such as faculty-student mixers and an annual dinner dance.

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

*An exclusive listing of graduate faculty and Graduate Council can be found in the Directory of the Graduate Bulletin.
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, school psychologist 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 lapse 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.

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.

- Provisional Admission may be granted to a person who has not met all of the requirements for full admission. 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 the 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 and 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 provided space and use of facilities within limits of practical need of the graduate 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.

International Students

International students are normally admitted for the fall semester. All credentials must be received by the previous April 1. Applicants seeking financial aid should submit all credentials by the previous January 1. International students should not plan to leave Akron until they have received both admission to a graduate program and the appropriate immigration materials from the Office of International Programs.

The first obligation of The University of Akron is to residents of the state of Ohio. Therefore only the most qualified international students can be admitted.
Graduate students will need approximately $11,200 for tuition and fees and living expenses for 9 months.

Applicants whose native language is not English are required to demonstrate high-level competence in the use of the English language, including reading, writing, speaking and listening, prior to admission. This competence is established by achieving a score of at least 650 on the TOEFL (the Test of English as a Foreign Language). The TOEFL is administered by Educational Testing Service, Box 898, Princeton, NJ 08540, USA. Applicants should make arrangements to take the test as soon as they arrive at The University of Akron and shall be required to submit official scores to the Graduate School, The University of Akron, Akron, OH 44325-2101. The official score sheet should be received in the Graduate School by June 1 for fall admission. Unofficial copies of the TOEFL cannot be accepted. If the TOEFL is not available, the applicant should contact the international student advisor at The University of Akron for other arrangements. Personal letters certifying English competence are not acceptable as substitutes for test scores.

The completion of an English placement test after admittance to the department head in the major is also required. Applicants whose native language is not English are required to demonstrate English proficiency through departmental certification. Teaching assistants must demonstrate proficiency in English through departmental certification. Those for whom English is not the native language and who expect to function as teaching assistants are required to provide the department with a test of English language proficiency. Applicants should make arrangements to take the test as soon as admission to The University of Akron is anticipated and should request ETS to forward the official test score directly to the Graduate School, The University of Akron, Akron, OH 44325-2101. The official score sheet should be received in the Graduate School by June 1 for fall admission. Unofficial copies of the TOEFL cannot be accepted. If the TOEFL is not available, the applicant should contact the international student advisor at The University of Akron for other arrangements. Personal letters certifying English competence are not acceptable as substitutes for test scores.

The completion of an English placement test after admittance will also be required. Based on the results of this test, a student may be required to take an English language course for credit.

An international student, coming to The University of Akron in good standing after one full year of work at an accredited American college or university, may have the English proficiency requirement waived upon written request.

Following the recommendation of the American College Health Association and the National Association for Foreign Student Affairs, The University of Akron requires all international students and exchange visitors (individuals on J and F visas) to carry medical insurance. Such health insurance coverage must be in effect during their stay in the United States. It must also include coverage for repatriation and medical evacuation if a student needs to be sent home for medical reasons. International students will not be permitted to register without proof of such coverage.

Teaching Assistants

Applicants whose native language is not English, who expect to become teaching assistants, are also required to achieve a minimum score of 220 on the TOEFL (Test of English as a Foreign Language) prior to functioning as teaching assistants. Those for whom English is the native language and who expect to function as teaching assistants must demonstrate proficiency in English through departmental certification. Neither the TOEFL nor departmental certification is required for research or administrative assistants.

Nonaccredited American School Graduates

A student holding a baccalaureate degree from a nonaccredited 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.

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 2.00 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:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Quality Points</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>C-</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>D+</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>D-</td>
<td>0.0</td>
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</tr>
<tr>
<td>F</td>
<td>0.0</td>
<td>Failure</td>
</tr>
<tr>
<td>CR</td>
<td>0.0</td>
<td>Credit</td>
</tr>
<tr>
<td>NC</td>
<td>0.0</td>
<td>No credit</td>
</tr>
<tr>
<td>AUD</td>
<td>0.0</td>
<td>Audit</td>
</tr>
</tbody>
</table>

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 for some part of the work is, for good and adequate 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 student’s department 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.

- NGH – 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 – Invalide: Indicates the grade reported by the instructor for the course was improperly noted and thus unacceptable for proper processing.

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, or 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-,” “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 admitted for one calendar year, and then only if evidence for expecting satisfactory performance is submitted and found acceptable.

Academic Dishonesty

Students at The University of Akron are an essential part of the educational objectives of the institution. Securing the freedom necessary for learning in a community so rich in diversity and achieving success toward our educational objectives requires the implementation of high standards of academic integrity. Academic dishonesty has no place in an institution of advanced learning. The University community should become familiar with the policies and regulations contained within the University Rules and Regulations Concerning Campus Conduct and Student Disciplinary Procedures available in the Student Discipline Office, Gardner 104, 1216 972-7907.

Because The University of Akron considers academic integrity to be an essential part of each student’s personal and intellectual growth, instances of academic dishonesty are addressed consistently. All members of the community must become actively involved in building a strong reputation of academic excellence and integrity here 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 use appropriate referencing of published or unpublished works on print/non-print materials.
- Unauthorized copying of an assignment in computer programming, or the unauthorized examination or viewing 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.

*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. For 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.

General Information
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.

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 university. The University of Akron to continue in one is the prerogative of the departments offering graduate programs. The department has the right to continue the examination and/or an academic sanction can be imposed. The responsibility for being properly registered lies to the students and the registrars. The student 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.

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

Fees

All fees reflect charges in 1994-95 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: $271.40
- Nonresident student per credit: $271.40 (auditors pay same fees)

General Fee
- 1-12 credits per semester: $6,54 per credit
- 13 credits and over per semester: $65.54 per credit

Parking Permit Fee
- 5 or more credits per semester: $57.50
- 4% or fewer credits per semester: $34.50
- One summer session: $20.50
- Workshop participants: $2 per day up to $18

Graduation Fees
- Each degree (except law): $30

Other Fees
- Thesis and binding: $60.00
- Microfilming (Ph.D./Ed.D. only): $50.00
- Copyright Fee: $38
- Application Fee: $60.00
- Change fee (for each transcript and $2 for each additional one): $4
- Late Graduation Application Fee: $10
- Late Registration Fee: $25
- Graduation fees: $60.00

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 materials. 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.

Registration

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

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.

Thesis and Dissertation Credits

Course number 699 will only be used for courses which indicate credit is being given for a master's thesis. 699 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.

Buchtel College of Arts and Sciences

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Fee</th>
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<tbody>
<tr>
<td>3100:51</td>
<td>Tropical Field Biology</td>
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<tr>
<td>3100:52</td>
<td>Conservation of Biological Resources</td>
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<td>3100:53</td>
<td>Freshwater Ecology</td>
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<td>Pathogenic Bacteriology</td>
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<td>Virology</td>
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<tr>
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<td>Physiology</td>
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<td>General Entomology</td>
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<td>Invertebrate Zoology</td>
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<td>Human Physiology</td>
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<td>Seminar Research Methods</td>
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<td>3350:525</td>
<td>Geographic Information Systems</td>
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<td>Thematic Cartography</td>
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<td>Map Compilation and Reproduction</td>
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<td>Automated Computer Mapping</td>
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<td>Advanced Remote Sensing</td>
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<td>Coastal Geology</td>
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</table>
### General Information

#### College of Nursing
- **Theoretical Basis for Nursing**
- **Computer Applications in Nursing**
- **Health Information Management**
- **Nursing Inquiry**
- **Resource Management in Nursing Settings**
- **Fiscal Management in Nursing Administration**
- **Organizational Behavior in Nursing Settings**
- **Nursing Administration I**
- **Nursing Administration II**
- **Scientific Components of Nurse Anesthesia**
- **Pharmacology for Nurse Anesthesia I**
- **Statistical Analysis of Anesthetics**
- **Pharmacology of Nurse Anesthesia II**
- **Principles of Anesthesia**
- **Professional Role Seminar**
- **Child and Adolescent Health Nursing I**
- **Child and Adolescent Health Nursing II**
- **Child and Adolescent Health Nursing III**
- **Pharmacology for Child and Adolescent Health Nursing**
- **Child and Adolescent Health Nursing IV**
- **Practicum: Child and Adolescent Health Nursing**
- **Liason-Community Mental Health Nursing I**
- **Liason-Community Mental Health Nursing II**
- **Liason-Community Mental Health Nursing III**
- **Liason-Community Mental Health Nursing IV**
- **Practicum: Liason-Community Mental Health Nursing**
- **Nursing Curriculum Development**
- **Evaluation in Nursing Education**
- **Practicum: The Academic Role of the Nursing Educator**

#### College of Business Administration
- **General Business Administration**
- **Advanced Microeconomics**
- **Applied Econometrics**
- **Financial Management Principles**
- **Financial Management Applications**

#### College of Engineering
- **Civil Engineering**
- **Computer Engineering**
- **Electrical Engineering**
- **Mechanical Engineering**

#### College of Education
- **Design and Production of Instructional Materials**
- **Introduction to Computer-Based Education**
- **Seminar in Computer-Based Education**

#### College of Business Administration
- **General Business Administration**

#### College of Fine and Applied Arts
- **Architectural Design**
- **Architectural Design II**
- **Advanced Food Preparation**
- **History of Furniture and Interiors I**
- **Experimental Foods I**
- **Professional Image Analysis**
- **Advanced Textiles**
- **Interiors, Textiles, and Product Analysis I**
- **Residential Design**
- **Commercial Design**
- **Principles and Practices of Interior Design**
- **Textile Conservation**
- **History of Western Costume to 1800**
- **History of Fashion Since 1700**

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- **History of Western Costume to 1800**
- **History of Fashion Since 1700**

### Fees and Costs
- **Registration Fees:**
  - $10 per course
  - $25 per course
  - $15 per course
  - $10 per course
  - $5 per course
- **Tuition Fees:**
  - $10 per course
  - $25 per course
  - $15 per course
  - $10 per course
  - $5 per course

### Regulations Regarding Refunds
All fees, e.g., instructional, general, parking, etc., are subject to change without notice. Tuition and fees shall be charged for all courses in which a grade is assigned. Schedule adoption 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
- **Instructional and nonresident surcharge.**
- **General fee.**
- **Course materials and computing fee.**
- **Student parking (only if permit is returned).**
- **Student teaching fee.**
- **Laboratory breakup and late service deposit.**
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 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%

• **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 semester, 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%

• 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.

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

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 $5,600 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.
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.

Transfer
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.

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.

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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 advisor 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 college 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.
Continuous Enrollment Requirement

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

Time Limit

All doctoral requirements must be completed within ten 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.

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 55 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 advisor 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.

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 limit to complete degree requirements beyond the master's degree. All transferred credits 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.

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 computer) 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.

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.

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.

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 advisor, 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.

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.
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 including:
  - Completion of a minimum of 36 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 doctoral 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 skilled building in basic psychological assessment and counseling, to actual work with clients, to 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 but must choose a specialization in one department. 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, psychodiagnoses, vocational development theory, intelligence testing, research and statistics, and professional issues. Research and publication are greatly encouraged. Graduates typically seek 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.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Psychology core courses</td>
<td>16</td>
</tr>
<tr>
<td>- Counseling psychology core courses</td>
<td>30</td>
</tr>
<tr>
<td>- Practicum sequence (671, 672, 673, 795 [4+4], 796 [4+4])</td>
<td>28</td>
</tr>
<tr>
<td>- Advanced Psychological Tests and Measures (750)</td>
<td>4</td>
</tr>
<tr>
<td>- Bectives (minimum)</td>
<td>6</td>
</tr>
<tr>
<td>- A statistics sequence that may be substituted</td>
<td>16</td>
</tr>
<tr>
<td>- Thesis credits (minimum)</td>
<td>8</td>
</tr>
<tr>
<td>- Dissertation credits (minimum)</td>
<td>12</td>
</tr>
</tbody>
</table>

• The comprehensive written examination is prepared, administered and graded by the faculty of the department in which the student is enrolled. 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—3,000 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 attain a 3.50 GPA in the psychology core or perform satisfactorily on the core mastery examination in order to be eligible for M.A., Ph.D. standing 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 designated by the student and the student's advisor, 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, applied cognitive aging psychology, or industrial gerontological 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) of 3.25;
  - completion of Graduate Record Examination Aptitude and Advanced Psychology Test;
  - securing of three letters of recommendation;
  - Mastery of M.A. core courses with a minimum 3.50 GPA in 3750:610, 620, 630, 640 or successful performance on core mastery examination.

- 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, applied cognitive aging, or industrial gerontological psychology. Core courses are specified in the Department of Psychology Graduate Student Manual. The student is required to maintain at least a 3.00 GPA in core courses and overall courses;
  - completion of additional required and elective courses to be planned in conjunction with the student's faculty advisor and subject to approval by the department industrial/organizational, applied cognitive aging, industrial gerontological committees.

- Written comprehensive examinations:
  - satisfactory performance on doctoral written and oral comprehensive examination in the student's major area of industrial/organizational psychology, applied cognitive aging, industrial gerontological psychology (refer to the department's graduate student handbook).

- Dissertation research:
  - completion of 3750:899 Doctoral Dissertation; minimum 12 credits
  - satisfactory performance on final oral 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 either the Miller Analogies Test (MAT) or the aptitude portion of 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 two of the following courses, such courses not to count toward meeting specialization requirements:
  - 3650:631 Social Psychology
  - 3650:645 Social Organization
  - 3650:687 Social Change
  - 3850:747 Urban Sociology

- 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 department's graduate student handbook).

- Complete a specialty of at least 15 credits.

- Complete a minimum total of 30 credits (semester) 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 (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, 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.
Master of Science

**Thesis Option**

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.

**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.

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**Chemistry**

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 also must specialize in an area.

**Areas of Specialization:**

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

Required Courses for both options:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3250-602</td>
<td>Macroeconomic Analysis I</td>
<td>3</td>
</tr>
<tr>
<td>3259-611</td>
<td>Microeconomic Theory I</td>
<td>3</td>
</tr>
<tr>
<td>3250-620</td>
<td>Applications of Mathematical Models to Economics*</td>
<td>3</td>
</tr>
<tr>
<td>3250-629</td>
<td>Statistics for Econometrics*</td>
<td>3</td>
</tr>
</tbody>
</table>

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

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**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.
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
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 theses). 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
3300:576 Theory and Teaching of Basic Composition
3300:670 Modern Linguistics
3300:673 Theories of Composition
3300:674 Research Methodologies in Composition

Other Available Courses for Both Options

Composition and Rhetoric:
3300:575 Theory of Rhetoric
3300:679 Scholarly Writing
3300:689 Seminar: Reading Theory

Linguistics:
3300:570 History of the English Language
3300:571 U.S. Dialects: Black and White
3300:599 Grammatical Structures of Modern English
3300:699 Sociolinguistics
3300:699 Continental Linguistics

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 (1100.111 for 2 credits and 1100.112 for 2 credits) are required for teaching Assistants. They do not count toward the degree requirements.

Geography and Planning

Master of Arts in Geography

Nonthesis Option
A minimum of 39 credit hours of graduate credits, of which at least 12 credit hours must be taken at the 600 level, excluding 3350:698 and 699.

Core Requirements – 12 credit hours
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:589 Field Research Methods
3350:687 History of Geographic Thought

Thesis – 9 credit hours
Electives – 15 credit hours, at least 3 credits of which must be from the following:
3350:600 SEM: 601, 618, 602 SEM: 602

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

Thesis Option
A minimum of 36 credit hours, of which at least 12 credit hours must be taken at the 600 level, excluding 3350:698 and 699.

Core Requirements (12 credit hours)
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:589 Field Research Methods
3350:687 History of Geographic Thought

Core Requirements – 12 credit hours
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:589 Field Research Methods
3350:687 History of Geographic Thought

Methods/Techniques Requirement
At least 4 courses (12 credit hours) from:
3350:505 Geographic Information Systems
3350:548 Automated Computer Mapping
3350:542 Geographic Information Systems
3350:547 Introduction to Remote Sensing
3350:588 ST: Computer Applications
3350:600 SEM: Spatial Analysis
3350:637 Planning Methods, 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 Head.

Master of Science in Geography

Nonthesis Option
A minimum of 36 credit hours, of which a minimum of 12 credit hours must be taken at the 600 level, excluding 3350:698 and 699.

Core Requirements – 15 credit hours
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:589 Field Research Methods
3350:687 History of Geographic Thought
3350:698 Advanced Spatial Analysis

Nonthesis Option
Core Requirements – 15 credit hours
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:589 Field Research Methods
3350:687 History of Geographic Thought
3350:698 Advanced Spatial Analysis

Electives – 12 credit hours
Any course taken outside the department must be approved in advance by the student's Graduate Advisor or the Department Head.

Master of Arts (Geography/Urban Planning)

A total of 45 credits of coursework plus internship (3350:688) as follows:

Core Requirements
3350:533 Introduction to Planning
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:634 Urban Land Use Analysis
3350:630 Introduction to Planning Theory
3350:631 Facilities Planning
3350:632 Land-Use Control
3350:633 Methods of Planning Analysis, I
3350:634 Methods of Planning Analysis, II
3350:635 Development of American Planning (new course)

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

Master of Arts

A total of 45 credits of coursework plus internship (3350:688) as follows:

Core Requirements
3350:533 Introduction to Planning
3350:581 Geographic Research Methods
3350:583 Spatial Analysis
3350:634 Urban Land Use Analysis
3350:630 Introduction to Planning Theory
3350:631 Facilities Planning
3350:632 Land-Use Control
3350:633 Methods of Planning Analysis, I
3350:634 Methods of Planning Analysis, II
3350:635 Development of American Planning (new course)
**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.
- Proficiency examination at the beginning of program to determine 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.

**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 5300.760 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.

**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 500 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 five 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.
  - Three courses: 3400.669 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.

**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 the 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 3450:512 Abstract Algebra II 3450:611 Topics in Algebra
  - All of the following courses: 3450:521 Real Analysis 3450:522 Measure Theory 3450:525 Analytic Function Theory 4650:592 Mathematical Sciences Seminar

**Environmental Geology**

Equivalents of the current science and mathematics requirements for the University's 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 advisor.
Thesis Option (30-39 credits)

In addition to the placement review and core requirements, 5-11 credits of 500/600-level courses in mathematics (3450), statistics (3460), or approved computer science (3460), and 2-4 credits in 3450/629 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 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 Concepts for Statistics, four credits, or 3450:521/622 Advanced Calculus 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 and Correlation 3
  - 3470:692 Mathematics and Statistics Seminar 2

Thesis Option (30-39 credits)

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 (33-42 credits)

In addition to the placement review and 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 six 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 (3450:526, 626) 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 the 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
  - 3450:626 Analytic Function Theory 3
  - 3450:627 Advanced Numerical Analysis I, II 6
  - 3450:654 Methods of Applied Mathematics I, II 6
  - 3450:692 Mathematical Sciences Seminar 2

Other Courses

- 3450:511 Advanced Linear Algebra 3
- 3450:521 Real Analysis 3
- 3450:627 Advanced Numerical Analysis I 3
- 3450:636 Optimization 3
- 3450:636 Advanced Combinatorics and Graph Theory 3
- 3470:651 Probability and Statistics 4
- 3470:655 Advanced Probability and Stochastic Processes 3
- 3470:692 Mathematical Sciences Seminar 2

Thesis Option (30-39 credits)

In addition to the placement review and core requirements, two to four credits of approved 500/600-level courses in mathematics (3450), statistics (3460), or computer science (3460), and two to four 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, nine 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 3470:691 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 7 of The University of Akron Bulletin. In addition to these requirements, the applicant must also:

- submit three letters of recommendation from individuals capable of evaluating the applicant's potential for success in this 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 (Arithmetic and Advanced Computer Science) Test 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.
    A. Programming Languages
    B. Operating Systems and Computer Architecture
    C. Theoretical Computer Science
    D. Data and File Structures
    E. 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), (560, 660), (570, 670), (675, 675)
  - 3460:692 Computer Science Seminar. This seminar is an introduction to research in computer science. For thesis options, students, it is the beginning of the thesis research.
**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:
    - 370:600 Scope and Theory of Political Science
    - 370:601 Research Methods in Political Science
  - 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 non-thesis 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.

### 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 3.00 grade-point average in M.A. core courses as well as overall.
  - Master of Arts examination (first year):
    - thesis option: Master of M.A. core courses with a minimum of 3.25 GPA in 3750:616, 620, 630, 640, or successful performance on core mastery examination;
    - Non-thesis option: written and oral comprehensive examinations in the specialty areas.
  - 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 30 credits of graduate work including thesis in industrial, organizational, counseling or applied cognitive aging psychology.

### Non-thesis Option

Completion of a minimum of 30 credits of graduate work with no thesis required. Completion of coursework, practicum and examinations in either personnel, counseling or applied cognitive aging psychology.
Public Administration and Urban Studies

Master of Arts in Urban Studies

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
- 3980:601 Advanced Research and Statistical Methods
- 3980:602 History of Urban Development
- 3980:641 Urban Economic Growth and Development
- 3980:643 Introduction to Public Policy
- 3980:658 Master's Thesis (optional)

Basic Program

Complete 33 credits of coursework as follows:
- Core - 15-18 credits.
- Electives - 15-18 credits.
- 3 credits of approved electives may be substituted for thesis with approval of an 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 to the MPA.

Degree Requirements

- The number of graduate credits required for the MPA will be as follows:
  - Master's Degree in Public Administration: 45 credits
- Core requirements (33-36 credits):
  - 3980:600 Basic Quantitative Research
  - 3980:601 Advanced Research and Statistical Methods
  - 3980:602 History of Urban Development
  - 3980:641 Urban Economic Growth and Development
  - 3980:643 Introduction to Public Policy
  - 3980:658 Master's Thesis (optional)

Joint Program

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.

J.D./Master of Public Administration

Degree Requirements

Seventy-six credits in law and 30 credits in public administration. Under this program a student must take 45 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 Law School and Public Administration as follows:

- The law requirements are reduced 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

- Complete three required core courses with at least a 3.00 grade-point average:
  - 3850:603 Sociological Research Methods
  - 3850:604 Social Research Design
  - 3850:617 Sociological Theory

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 3850:659, 3850:697 and 3980:658). 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
  - 3850:604 Social Research Design
  - 3850:617 Sociological Theory
  - 3850:631 Social Psychology
  - 3850:645 Social Organization
  - 3850:706 Multivariate Techniques in Sociology

- Complete at least six hours of thesis work (3850:659). 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 900 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
  - 3850:604 Social Research Design
  - 3850:617 Sociological Theory
  - 3850:631 Social Psychology
  - 3850:645 Social Organization

*Students may take 3250:606 Public Finance and 3250:506 State and Local Finance to fulfill the requirements of 3850:640 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 3850:674 or 3980:673 in lieu of 3850:629. Students may also take either 3850:671 or 3980:620 in lieu of 3980:643.
• 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

Nicholas D. Sylvester, Ph.D., Dean
Max S. Willis, Jr., Ph.D., Associate Dean, Research and Graduate Studies
S. Graham Kelly III, Ph.D., Associate Dean, Undergraduate Studies

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’s 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 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 requirement 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 16 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 5 graduate credits.

Chemical Engineering
4200:226 Equilibrium Thermodynamics 4
4200:322 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
4300:310 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

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 admittance 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 proposal’s intent is to limit the administrative mechanism to the College and the departments while the interdisciplinary programs could be expanded to adapt to the changing research or funding trends. Since the approval of the proposal, Biomedical Engineering and Polymer Engineering have been added to the list of 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 conservation, 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, 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.

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.

The interdisciplinary doctoral program permits doctoral student access to the academic resources of the entire college and provides a sound economic base for a program that must deal with doctoral student populations that are much smaller than those for undergraduate or master degrees.

COORDINATED AND JOINT PROGRAMS

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 and completing a dissertation. The examination, completed by 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 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 undergraduate 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 from both departments in the College of Engineering and participating program faculty from the Department of Mathematical Sciences. The participating faculty from the Department Sciences must hold joint appointments in the College of Engineering.

Students lacking a bachelor’s degree of 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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3450:312</td>
<td>Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>3450:427</td>
<td>Introduction to Numerical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>3450:436</td>
<td>Advanced Engineering Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>3450:439</td>
<td>Advanced Engineering Mathematics II</td>
<td>3</td>
</tr>
<tr>
<td>3450:421</td>
<td>Advanced Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>3450:422</td>
<td>Advanced Calculus II</td>
<td>3</td>
</tr>
</tbody>
</table>

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.

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 adjoint 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.

A Coordinated 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 about the program 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 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
- Organic Chemistry I and II
- Principles of Biology I and II
- M.D., Ph.D.
- Classical Physics I and II
- Ph.D.
- Statics
- Dynamics
- Strength of Materials or Material Science
- Basic Electrical Engineering (or Circuits I & II)
- Calculus I, II, III, and Differential Equations
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 in any way the degree requirements for either program.

MASTER OF SCIENCE DEGREES

The degrees of Master of Science in Electrical Engineering, Master of Science in Civil 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

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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>4200:325</td>
<td>Equilibrium Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>4200:321</td>
<td>Transport Phenomena I</td>
<td>3.5</td>
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<tr>
<td>4200:322</td>
<td>Transport Phenomena II</td>
<td>3.5</td>
</tr>
<tr>
<td>4200:330</td>
<td>Chemical Reaction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>4200:351</td>
<td>Fluid and Thermal Operations</td>
<td>3</td>
</tr>
<tr>
<td>4200:353</td>
<td>Mass Transfer Operations</td>
<td>3</td>
</tr>
<tr>
<td>4200:455</td>
<td>Process Analysis and Control</td>
<td>3</td>
</tr>
<tr>
<td>4200:441</td>
<td>Process Economics and Design</td>
<td>4</td>
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Civil Engineering

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<th>Course Title</th>
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<tr>
<td>4200:300</td>
<td>Theory of Structures</td>
<td>3</td>
</tr>
<tr>
<td>4200:313</td>
<td>Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>4200:310</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>4200:323</td>
<td>Water Supply and Wastewater Disposal</td>
<td>4</td>
</tr>
<tr>
<td>4200:344</td>
<td>Hydraulics</td>
<td>3</td>
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<td>4200:361</td>
<td>Transportation Engineering</td>
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<tr>
<td>4200:401</td>
<td>Steel Design</td>
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<td>4200:403</td>
<td>Reinforced Concrete Design</td>
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Electrical Engineering

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<tr>
<td>4400:300</td>
<td>Physical Electronics</td>
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<tr>
<td>4400:361</td>
<td>Electronic Design</td>
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<tr>
<td>4400:365</td>
<td>Switching and Logic</td>
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<td>4400:384</td>
<td>Energy Conversion I</td>
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<td>4400:385</td>
<td>Energy Conversion Lab</td>
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<td>4400:445</td>
<td>Analog Communications</td>
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<td>4400:453</td>
<td>Antenna Theory</td>
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<td>4400:472</td>
<td>Control Systems II</td>
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Mechanical Engineering

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<th>Course Title</th>
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<tbody>
<tr>
<td>4600:300</td>
<td>Thermodynamics I</td>
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<td>4600:321</td>
<td>Thermodynamics II</td>
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<tr>
<td>4600:310</td>
<td>Fluid Mechanics</td>
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</tr>
<tr>
<td>4600:315</td>
<td>Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>4600:338</td>
<td>Analysis of Mechanical Components</td>
<td>3</td>
</tr>
<tr>
<td>4600:340</td>
<td>Systems Dynamics and Response</td>
<td>3</td>
</tr>
<tr>
<td>4600:360</td>
<td>Mechanical Metallurgy</td>
<td>3</td>
</tr>
<tr>
<td>4600:444</td>
<td>Fundamentals of Mechanical Vibrations</td>
<td>3</td>
</tr>
<tr>
<td>4600:441</td>
<td>Control System Design</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
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</tr>
</tbody>
</table>

Degree Requirements

The University's Academic Requirements (See Academic Requirements in this Graduate Bulletin, the following College of Engineering's and department's academic requirements must 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 "fals" deferred 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>4200:600</td>
<td>Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>4200:605</td>
<td>Chemical Reaction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>4300:610</td>
<td>Classical Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>4300:650</td>
<td>Chemical Engineering Electives*</td>
<td>6</td>
</tr>
<tr>
<td>Approved Electives</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Approved Mathematics</td>
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<tr>
<td>Master's Thesis</td>
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**Nonthesis Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
</thead>
<tbody>
<tr>
<td>4200:600</td>
<td>Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>4200:605</td>
<td>Chemical Reaction Engineering</td>
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<td>Classical Thermodynamics</td>
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<td>4300:650</td>
<td>Chemical Engineering Electives*</td>
<td>6</td>
</tr>
<tr>
<td>Approved Electives</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Approved Mathematics</td>
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<td>3</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

Chemical engineering students in both degree options must pass a comprehensive examination and 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Civil Engineering Courses</td>
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</tr>
<tr>
<td></td>
<td>Approved Mathematics of Science</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Approved Electives</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Master's Thesis</td>
<td>6</td>
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<tr>
<td>Total</td>
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**Nonthesis Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Civil Engineering Courses</td>
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</tr>
<tr>
<td></td>
<td>Approved Mathematics of Science</td>
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<td></td>
<td>Approved Electives</td>
<td>6</td>
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<tr>
<td></td>
<td>Engineering Report</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electrical Engineering Courses*</td>
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</tr>
<tr>
<td></td>
<td>Approved Mathematics</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Approved Electives</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Master's Thesis</td>
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</tr>
<tr>
<td>Total</td>
<td></td>
<td>30</td>
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**Nonthesis Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electrical Engineering Courses*</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Approved Mathematics</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Approved Electives</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
</tr>
</tbody>
</table>

*The required chemical engineering coursework may not include more than three credits of 500 level courses.
**The required electrical engineering coursework of 16 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>4800:601</td>
<td>Biomedical Instrumentation</td>
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</tr>
<tr>
<td>4800:611</td>
<td>Biometry</td>
<td>3</td>
</tr>
<tr>
<td>3100:695</td>
<td>Physiology for Engineers and Lab</td>
<td>5</td>
</tr>
</tbody>
</table>
- Approved Electives 15
- Master's Thesis 6
- Total 33

Polymer Engineering Specialization**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymer Engineering Core</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Polymer Engineering Electives</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>
- Approved Engineering and Science Elective 3
- Thesis 6
- Total 32

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
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 fulfilling 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.
- Completion of preliminary examinations on foundation studies and the major field of concentration.
- 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 advisor 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 advisor, 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 advisor, subject to review by the department head, in lieu of the foreign language requirement.
- Completion of at 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 12 credits. The oral examining committee must be constituted of at least five full-time faculty members, one of whom must be from outside the college.
- Pass the general requirements of the Doctor of Philosophy degree.

*Meta-advanced graduate business courses shall be required of students who have completed similar undergraduate curricula at institutions that require the Assistant Dean and Director of Graduate Business Programs, College of Business Administration.

**E620.601 is a prerequisite for E640.602.

DOCTORAL PROGRAMS IN COUNSELING

Collaborative Ph.D. Program in Counseling Psychology

The Collaborative Program in Counseling Psychology allows the student 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-effective, and individual bases of human behavior. Counseling psychology coursework covers the special areas of group counseling, theories of counseling and psychotherapy, supervision, vocational psychology, ethics, assessment, and research design. Practicum 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. A yearlong, 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 (3750/5601, 620, 630, 640) is required of all students.
- Students register for dual listed courses (370/5600) under their home department code.
- The comprehensive written examination is prepared, administered, and graded by the department faculty of the track in which the student is enrolled. 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 Internship Centers (APIC) Directory.
- Language and residency requirements are to be completed in accordance with the guidelines from the Graduate School and student's home department.

Collaborative Program requirements:

- Psychology Core (3750/5601, 620, 630, 640) is required of all students.
- Students register for dual listed courses (370/5600) under their home department code.
- The comprehensive written examination is prepared, administered, and graded by the department faculty of the track in which the student is enrolled. 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 Internship Centers (APIC) Directory.
- Language and residency requirements are to be completed in accordance with the guidelines from the Graduate School and student's home department.

Course Requirements

- Psychology Core I (3750/5601)
- Psychology Core II (3750/5602)
- Psychology Core III (3750/5603)
- Psychology Core IV (3750/5604)
- Group Counseling (3750/5605)
- Supervision in Counseling Psychology I (3750/5607)
- Theories of Counseling and Psychotherapy (3750/5607)
- Vocational Behavior (3750/5609)
- Principles and Practice of Intelligence Testing (3750/5609)
- Advanced Seminar in Counseling Psychology (3750/5607)
- Objective Personality Evaluation (3750/5608)
- Research Design in Counseling (3750/5606)
- Counseling Psychology Practicum (3750/5606)
- Doctoral Dissertation (minimum) (3750/5607)

The Comprehensive Exam is required of all students. At least one faculty member from each track participates in the oral portion of the examination. The dissertation is required of all students.

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 Internship Centers (APIC) Directory.

Language and residency requirements are to be completed in accordance with the guidelines from the Graduate School and student's home department.

Credits are earned for the completion of the dissertation. The dissertation must be submitted in accordance with the guidelines from the Graduate School and student's home department.
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. Practice 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 admission to professional counseling programs.

Accreditation of the program is achieved through the American Association for Marriage and Family Therapy. Graduates with a specialty in Marriage and Family Therapy will be considered for recognition by a specialized accrediting body recognized by the Council on Postsecondary Education for Accreditation (CO4).

Ph.D. in Guidance and Counseling Requirements:

Master's Degree

- Foundations of Education: 31-34
- Research and Statistics: 12

Electives

- Statistics in Education: 5100:741
- Advanced Educational Statistics: 5100:743
- Research Design in Counseling I: 5600:715
- Research Design in Counseling II: 5600:716

Major: Guidance and Counseling

- Must be taken after admission to the doctoral program:
  - 5600:702 Advanced Counseling Practicum
  - 5600:695 Internship in Counseling
  - 5600:701 Supervision in Counseling Psychology I
  - 5600:708 Supervision in Counseling-Psychology II
  - 500: Major Electives

Cognate

Cognate coursework must be taken outside the College of Education and approved by the major advisor.

Electives

Electives to be selected with the approval of the students' major advisor.

Dissertation

Minimum Total Semester Credits: 120

Generally a minimum of 60 semester hours must be taken after the student is admitted into the doctoral program in guidance and counseling.

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, group counseling, and family therapy; (2) group training; (3) career education; (4) supervision in counseling; (5) individual counseling; (6) program evaluation; (7) research techniques; and (8) counseling techniques.

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 5600:695 after admission to the doctoral program.

Selected with the approval of the student's major advisor 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 contained within the study of 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:

- Preliminary examination must be taken at first scheduled opportunity after student's full admission.
- 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. The 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 advisor, design a "field of study" to meet higher 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.

Doctoral Program Requirements

Foundation Studies Education - Doctoral Program Requirements*

**Behavioral Studies**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>5100:620</td>
<td>Behavioral Bases of Education</td>
<td>3</td>
</tr>
<tr>
<td>5100:624</td>
<td>Seminar in Educational Psychology</td>
<td>3</td>
</tr>
<tr>
<td>5100:721</td>
<td>Learning Processes</td>
<td>3</td>
</tr>
<tr>
<td>5100:723</td>
<td>Teaching Behavior and Instruction</td>
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**Humanistic Studies**

<table>
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<tbody>
<tr>
<td>5100:701</td>
<td>History of Education in American Society</td>
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</tr>
<tr>
<td>5100:703</td>
<td>Seminar in History and Philosophy of Higher Education</td>
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</table>

**Social and Philosophical Studies**

<table>
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<th>Title</th>
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</thead>
<tbody>
<tr>
<td>5100:600</td>
<td>Philosophies of Education</td>
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</tr>
<tr>
<td>5100:602</td>
<td>Comparative and International Education</td>
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</tr>
<tr>
<td>5100:604</td>
<td>Seminar in Cultural Foundations of Education</td>
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</tr>
<tr>
<td>5100:705</td>
<td>Seminar in Social-Philosophical Foundations</td>
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**Research**

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<tbody>
<tr>
<td>5100:640</td>
<td>Techniques of Research</td>
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</tr>
<tr>
<td>5100:741</td>
<td>Statistics in Education</td>
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</tr>
<tr>
<td>5100:690</td>
<td>Doctoral Dissertation</td>
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</table>

*Courses psychology students contact advisor 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 approved by their advisers during each fall and spring semester. Individual departments may exceed this minimum requirement. Doctoral students should consult with their advisers about additional requirements.

MARTS'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 in guidance and administration 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
5100:602 Comparative International Education 3
5100:604 Seminar in Cultural Foundations of Education 3
5100:620 Behavioral Bases of Education 3
5100:624 Seminar in Educational Psychology 3
5100:640 Seminar in Educational Psychology 3

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. Programs 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 to certification.

The Council for Accreditation of Counseling and Related Educational Programs (CACREP), a specialized accrediting agency recognized by the Council on Post-secondarv Accreditation (COAPA), has conferred accreditation on the Community Counseling program and the Counseling in Elementary or Secondary Schools program in the Department of Counseling and Special Education.

The Marriage and Family Therapy program has been accredited by the American Association of Marriage and Family Therapy (AAMFT).

Classroom Guidance for Teachers

- Foundation Studies courses - nine credits.
- Guidance courses - 21 credits.

5600:610 Counseling Skills for Teachers 3
5600:631 Elementary School Guidance 3
5600:633 Secondary School Guidance 3
5600:645 Group Testing in Counseling 3
5600:647 Career Development and Counseling Across the Life Span 3
5600:667 Seminar in School Counseling 3
5600:671 Counseling/Clinic Test Interpretation 1
5600:695 Field Experience 1
5610:540 Developmental Characteristics of Exceptional Individuals 4
5610:604 Education and Management Strategies for Parents of Exceptional Individuals 3

* Students in some psychology programs may choose another option - see adviser.
1 Must be taken concurrently with 661.

- Area of concentration: 5-8 credits
- A minimum of eight credits may be selected from one of the following (the student may, with adviser approval, propose an area of concentration not listed). The courses in the area of concentration must be selected with, and approved by, an adviser.

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
Counseling

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 license elsewhere in this handbook.) Any changes in the agreed-upon program must be approved by the student's adviser.

- Foundation (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
    5600:660 Seminar in Counseling 1
    5600:675 Community Counseling 3
  - Subtotal 4

  - Counseling Theory
    5600:643 Counseling Theory & Philosophy 3
    5600:647 Career Counseling: Theory & Practice 3
  - Subtotal 6

  - Appraisal
    5600:645 Tests and Appraisal in Counseling 4
    5600:667 Practicum in Counseling** 5
  - Subtotal 12

  - Internship
    5600:685 Internship in Counseling 6-7
    5600:687 San Francisco 9-7
  - Minimum Department Hours Required 32-33

- Specialized Studies (required)
  5600:920 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
  3750:721 Psychology of Adolescence 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 Management and Family Therapy: Theory and Techniques 3
  5600:657 Marriage Therapy (Prerequisite 5600:655) 3
  5600:669 Systems Theory in Family Therapy (Prerequisite 5600:655) 3

Graduate Studies 35
**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 advisor.

- **Foundations (select one course from each area)**
  - Behavioral Foundations
    - 5600:648 Individual and Family Development
    - 5600:646 Multicultural Counseling
  - Humanistic Foundations
    - 5600:654 Individual and Family Development Across the Life Span
  - Research
    - 5100:640 Techniques of Research
    - 5100:741 Statistics in Education
  - Minimum Foundation Hours Required
    - 4

- **Required Counseling Department Courses**
  - Professional Orientation
    - 5600:660 Seminar in Counseling
    - 5600:655 Marriage and Family Therapy: Theories and Techniques
    - Subtotal
    - 3
  - Counseling Process (all required)
    - 5600:659 Techniques of Counseling*
    - 5600:653 Group Counseling
    - Prerequisite: 5600:651 and 5600:654
    - 5600:675 Practicum in Counseling**
    - Prerequisite: 5600:653
    - Subtotal
    - 4
  - Internship
    - 5600:685 Internship in Counseling two terms*
    - Prerequisite: 5600:675
    - Subtotal
    - 6
  - Minimum Department Hours Required
    - 35-36

**School Psychologist**

- **Major Requirements**
  - 5100:649 Techniques of Research
  - 5620:999 Professional Seminar
  - 5620:998 Master's Problem
  - 5620:698 Master's Thesis
  - Departmental Requirements
    - 5600:640 Counseling, Theory, and Techniques

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*Note: Students admitted for enrollment in Fall 1994 and thereafter will be required to complete a minimum of 60 semester credit hours in order to fulfill degree requirements.*

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**Independent Study, Field Experience, Practicum, and Internship require class permission. You must get one from the Department office prior to registering.**
**Program Requirements:****

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3750:530</td>
<td>Psychological Disorders of Childhood</td>
</tr>
<tr>
<td>3750:700</td>
<td>Survey of Psychomotor Techniques</td>
</tr>
<tr>
<td>3750:717</td>
<td>Principles and Practice of Individual Intellige</td>
</tr>
<tr>
<td>5100:604</td>
<td>Seminar in Cultural Foundations</td>
</tr>
<tr>
<td>5100:624</td>
<td>Seminar in Human Learning</td>
</tr>
<tr>
<td>5100:741</td>
<td>Statistics in Education</td>
</tr>
<tr>
<td>5620:600</td>
<td>Seminar: Role and Function of School Psychology</td>
</tr>
<tr>
<td>5620:602</td>
<td>Behavioral Assessment</td>
</tr>
<tr>
<td>5620:610</td>
<td>Educational Diagnosis for the School Psychologist</td>
</tr>
</tbody>
</table>

**Sixth-Year School Psychology Master's Degree and Certification Program:**

- **Foundations requirements:**
  - 5100:604 Seminar in Cultural Foundations
  - 5100:624 Seminar in Educational Psychology
  - 5100:640 Techniques of Research
  - 5100:741 Statistics in Education

- **Professional requirements:**
  - 3750:700 Survey of Psychomotor Techniques
  - 3750:712 Principles and Practices of Individual Intellige
  - 5600:643 Counseling: Theory and Philosophy
  - 5620:607 Seminar: Role and Function of School Psychology
  - 5620:607 Behavior Assessment
  - 5620:610 Educational Diagnosis for the School Psychologist
  - 5620:694 Research Project in Special Area
  - 5620:698 Master's Problem
  - 5620:698 Master's Thesis

The student completing the master's program who desires Ohio certification must additionally complete the following listed certification/professional course requirements:

- 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
  - 5610:543 Developmental Characteristics of Learning Disabled Individuals
  - 5620:680 Reading, Diagnosis: School Psychology and Support Personnel
  - 5610:640 Developmental Characteristics of Exceptional Individuals
  - 5610:520 Abnormal Psychology
  - 5620:603 Consultation Strategies for School Psychology
  - 5620:611 Practicum in School Psychology

The student completing the above listed program will be recommended for Ohio certification if they have completed the following:

- 5620:630 Internship: School Psychology
- 5620:640 Field Seminar I: Professional Topics/Issues in School Psychology
- 5620:641 Seminar II: Low Incidence/Mildly Handicapped

**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. Additional hours are necessary for the completion of the Supervisors Certificate. Additional hours are also necessary for teacher certification in special education. The adviser will assist in program planning.

**Educational Foundations and Leadership:**

**Educational Administration:**

The Department of Educational Administration 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 advisor 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:**
- **Registered courses:**
  - 5700:601 Principles of Educational Administration
  - 5700:603 Administration of Educational Personnel
  - 5700:606 Evaluation in Educational Organizations
  - 5700:607 School Law
  - 5700:608 School Finance and Economics
  - 5700:615 Computer Applications in Educational Administration
  - 5700:684 Field Experience I: Elementary Administration
  - 5700:686 Field Experience I: Secondary Administration
  - 5700:695 Field Experience I: The Superintendent
  - 5700:706 Collective Bargaining and Employee Relations
  - 5700:707 The Superintendent

**Educational Foundations and Leadership:**

- **Foundation core (nine credits):**
  - 5100:600 Philosophies of Education
  - 5100:604 Seminar in Cultural Foundations
  - 5100:620 Behavioral Basis of Education
  - 5100:624 Seminar: Educational Psychology
  - 5100:640 Techniques of Research
  - 5200:610 Research Design and Techniques of Research
  - 5610:601 Seminar: Curriculum Planning in Special Education
  - 5610:605 Program Development and Service Delivery Systems in Special Education
  - 5610:606 Research Design and Practice in Special Education
  - 5610:603 Assessment and Educational Programming in Special Education
  - 5610:604 Education and Management Strategies for Exceptional Individuals
  - 5610:612 Issues in Special Education

- **Department: Master's Papers (three credits):**
  - 5610:694 Research Project in Special Area (Thesis)
  - 5610:696 Master's Problem: Special Education
  - 5610:698 Master's Thesis

- **Elections (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
- 5100:620 Behavioral Basis of Education
- 5100:640 Techniques of Research
- 5700:610 Principles of Educational Supervision
- 5700:684 Principles of Curriculum Development
- 5610:601 Seminar: Curriculum Planning in Special Education
- 5610:602 Supervision in Special Education
- 5700:696 Field Experience for Supervisors
- 5700:740 Theories of Educational Supervision

*May be waived if completed as undergraduate*

**General Administration (Specialized Programs):**

- **Foundation Studies – nine credits:**
- **Registered courses:**
  - 5700:601 Principles of Educational Administration
  - 5700:603 Administration of Educational Personnel
  - 5700:606 Evaluation in Educational Organizations
  - 5700:607 School Law
  - 5700:608 School Finance and Economics
  - 5700:615 Computer Applications in Educational Administration
  - 5700:684 Field Experience I: Elementary Administration
  - 5700:686 Field Experience I: Secondary Administration
  - 5700:695 Field Experience I: The Superintendent
  - 5700:706 Collective Bargaining and Employee Relations
  - 5700:707 The Superintendent
Higher Education Administration (Specialized Option)

- Foundation studies – nine credits. (5100:703 is required.)
- Required courses:
  5600:649 Counseling and Personnel Service in Higher Education (3)
  5700:601 Principles of Educational Administration (3)
  5700:704 Advanced Principles of Educational Administration (2)
  5600:700 Introductory Administrative Colloquium in Higher Education (1)
  5900:726 Finance and Higher Education (3)
  5900:721 Law and Higher Education (3)
  5900:730 Curriculum and Program Planning in Higher Education (1)
  5900:800 Advanced Administrative Colloquium in Higher Education (1)
  5900:801 Internship in Higher Education (2)
  6900:802 Internship in Higher Education Seminar (1)

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)
  5700:706/707 Internship (3)
  6200:631 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 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:
  5200:530 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)
  5700:689 Field Experience II: Elementary Administration (2)

Post-Master’s Degree Requirements for Ohio Certification as an Elementary School Principal:

- Administration courses:
  5300:619 Secondary School Curriculum and Instruction (7)
  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)
- 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 (7)
  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:

- Administration courses:
  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* (2)
  5700:612 Administration of Educational Facilities (2)
  5700:615 Computer Applications in Educational Administration (2)
  5700:684 Field Experience I: Elementary Administration* (2)
  5700:686 Field Experience I: Secondary Administration* (2)
  5700:695 Field Experience for Supervisors* (3)
  5700:706 Collective Bargaining and Employee Relations* (2)
  5700:707 The Superintendency (3)
  5700:896 Field Experience: The Superintendency* (2)
  5700:897 Independent Study: Business Management** (3)
  6200:601 Financial Accounting** (3)
  6900:600 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)
  5100:742 Advanced Educational Statistics** (3)
  5100:801 Research Seminar** (3)
  5100:802 Research Seminar II: Research Seminar** (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)
  5700:664 Field Experience I: Elementary Administration* (2)
  5700:686 Field Experience I: Secondary Administration* (2)
  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 Educational Administration* 3
    5700:603 Administration of Educational Personnel* 3
    5700:605 Evaluation in Educational Organizations* 2
    5700:607 School Law* 3
    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: Elementary Administration* 2
    5700:695 Field Experience: The Superintendent** 3
  • Field Experience: Secondary Administration* 2
  • Field Experience: Secondary Administration* 2
  • Field Experience: The Superintendent** 2

Administrative Specialist: Instructional Services
• Foundation Studies – nine credits.*
  • Required courses:
    5200:630 Elementary School Curriculum and Instruction** 2
    5300:619 Second Year Curriculum and Instruction** 2
    5400:611 Elementary School Supervision of Curriculum Development** 2
    5700:603 Administration of Educational Personnel* 3
    5700:606 Evaluation in Educational Organizations* 3
    5700:607 School Law* 7
    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: Elementary Administration* 2
    5700:685 Field Experience: Secondary Administration* 2
    5700:695 Field Experience: Supervisors* 3
    5700:697 Independent Study: Instructional Services** 3
    5700:706 Collective Bargaining and Employee Relations* 2
    5700:707 The Superintendent* 2
    5700:708 Field Experience: The Superintendent** 2

Administrative Specialist: Pupil Personnel Administration
• Foundation Studies – nine credits.*
  • Required courses:
    5600:631 Elementary Counseling** 3
    5600:632 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* 2
    5700:609 Principles of Educational Administration* 3
    5700:615 Computer Applications in Educational Administration* 2
    5700:684 Field Experience: Elementary Administration* 2
    5700:685 Field Experience: Secondary Administration* 2
    5700:686 Field Experience: Supervisors* 3
    5700:695 Collective Bargaining and Employee Relations* 2
    5700:707 The Superintendent* 2
    5700:708 Field Experience: The Superintendent** 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* 3
    5700:604 School-Community Relations** 3
    5700:606 Evaluation in Educational Organizations* 3
    5700:607 School Law* 3
    5700:608 School Finance and Economics* 3
    5700:609 Computer Applications in Educational Administration* 2
    5700:610 Secondary Administration* 3
    5700:631 Elementary Administration* 3
    5700:684 Field Experience: Elementary Administration* 2
    5700:686 Field Experience: Secondary Administration* 2
    5700:695 Field Experience: Supervisors* 3
    5700:706 Supervision of Instruction: Special Education** 2
    5700:707 Supervision of Instruction: Special Education** 3
    5700:895 Two field experiences are required 45

**Administrative Specialist: Special Education (Exceptional Children)**
• Foundation Studies – nine credits.*
  • Required courses:
    5100:540 Developmental Characteristics of Exceptional Individuals** 3
    5100:561 Seminar: Curriculum Planning* 3
    5100:562 Supervision of Instruction: Special Education** 3
    5610:526 Program Development and Delivery Systems** 3
    5610:601 Independent Study: Exceptional Children** 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* 3
    5700:608 School Finance and Economics* 3
    5700:615 Computer Applications in Educational Administration* 2
    5700:684 Field Experience: Elementary Administration* 2
    5700:685 Field Experience: Secondary Administration* 2
    5700:695 Field Experience: Supervisors* 3
    5700:706 Collective Bargaining and Employee Relations* 2
    5700:707 The Superintendent* 2
    5700:708 Field Experience: The Superintendent** 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 Superintendent 3
  • Required courses – post-master's:
    5700:602 School Business Administration 2
    5700:603 Administration of Educational Personnel 2
    5700:604 School Community Relations 2
    5700:612 Administration of Educational Facilities 2
    5700:706 Collective Bargaining and Employee Relations 2
    5700:895 Two field experiences are required 45

Superintendent
• All of the assistant superintendent requirements plus
  5700:704 Advanced Principles of Educational Administration 2
  • Electives, as needed, to bring the program to a total of 60 graduate semester hours.

Supervisor
• Foundation Studies – nine credits.
  • Major field:
    5200:630 Elementary School Curriculum and Instruction* 2
    5200:732 Supervision of Instruction in the Elementary School* 2
    5400:619 Secondary School Curriculum and Instruction** 2
    5600:721 Supervision of Instruction in the Secondary School** 3
    5610:501 Seminar: Special Education Curriculum Planning 3
    5610:602 Supervision of Instruction: Special Education** 3
    5700:603 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

*Required only of an elementary student.
**Required only of a secondary student.
***Required only of a special education student.
**Educational Foundations**

This 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.

A student’s program of study will be determined jointly by the student and an academic advisor. Emphasis can range from advanced instructional technology to traditional studies in educational psychology or the social/philosophical aspects of education. A thesis or problem paper is required.

* Foundation Studies – College Core Foundation Studies.
* Departmental requirements:

The student will earn a minimum of 15 credits, excluding thesis or problem paper, within the Department of Educational Foundations and Leadership. These credits will be distributed between the social foundations, psychological studies, and evaluation and research with a minimum of nine credits from one of these areas and six credits from the other (college requirements may be included).

**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 Different Youth 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
  - 5630:586 Teaching Reading and Language Arts to Bilingual Students 4
  - 5630:585 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
  - 5600:640 Group Testing in Counseling 3
  - 5630:581 Multicultural Education in the United States 3
  - 5630:582 Characteristics of Culturally Different Youth 3
  - 5630:585 Seminar: Education of the Culturally Different 2
  - Electives in related special fields – 17 credits.

**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 advisor. The thesis provides the student with research/scholarly writing experiences that form the foundation for further study at the doctoral level.

* Two seminars are required.
** After accumulating 21 credits, the student will take a master’s comprehensive examination.
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 athletic trainers having an undergraduate degree in the same area. Students interested in this program should consult the instructor and obtain a petition prior to enrollment. Admission is based on an interview conducted by the athletic training staff. A brief statement of interest in this program should be submitted to the instructor. The program includes courses in anatomy, physiology, and exercise science.

Physical Education

The physical education program, requiring 30 credits, is designed for post-baccalaureate and in-service physical educators. The program requires 30 credits, including 15 credits of core courses and 15 credits of elective courses.

Required Courses:
- Introduction to Physical Education
- Foundations of Physical Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Electives:
- Human Physiology
- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Option: Adapted Physical Education

The Adapted Physical Education option is designed for advanced study in teaching physical education to handicapped individuals. Emphasis is given to a developmental model using assessment and planning techniques.

Required Courses:
- Introduction to Physical Education
- Foundations of Physical Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Electives:
- Human Physiology
- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Outdoor Education

The outdoor education program, requiring 32 credits, is designed for 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 parks programs, or private and public agencies which conduct outdoor/environmental education programs.

Required Courses:
- Introduction to Outdoor Education
- Foundations of Outdoor Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Electives:
- Human Physiology
- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Outdoor Education: Rural Influences

The outdoor education program, requiring 32 credits, is designed for 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 parks programs, or private and public agencies which conduct outdoor/environmental education programs.

Required Courses:
- Introduction to Outdoor Education
- Foundations of Outdoor Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Electives:
- Human Physiology
- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Outdoor Education: Special Topics

The outdoor education program, requiring 32 credits, is designed for 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 parks programs, or private and public agencies which conduct outdoor/environmental education programs.

Required Courses:
- Introduction to Outdoor Education
- Foundations of Outdoor Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Electives:
- Human Physiology
- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Outdoor Education: Rural Influences

The outdoor education program, requiring 32 credits, is designed for 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 parks programs, or private and public agencies which conduct outdoor/environmental education programs.

Required Courses:
- Introduction to Outdoor Education
- Foundations of Outdoor Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Electives:
- Human Physiology
- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

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- Statistics
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Electives:
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- Advanced Cardiovascular Physiology
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Special Topics in Physical Education
- Statistics
- Seminar in Physical Education

Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
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- Foundations of Outdoor Education
- Motor Development
- Administration of Physical Education
- Special Topics in Physical Education
- Statistics
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Electives:
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Required Department Courses:
- Foundations and Elements of Adapted Physical Education
- Motor Development of Special Populations
- Administration of Physical Education
- Physiology of Motor Activity and Exercise
- Special Topics in Exercise Science
- Statistics
- Seminar in Physical Education

Graduate Studies

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**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 Behavioral Bases of Education 3
  - 5100:624 Seminar in Human Development and Education
  - 5100:640 Techniques of Research

- **Required Department Courses:**
  - 3100:561 Human Physiology 4
  - 3100:562 Human Physiology 4
  - 3100:565 Advanced Cardiovascular Exercise 3
  - 5550:606 Physiology of Muscular Activity and Exercise 3
  - 5550:606 Statistics: Qualitative and Quantitative Methods 3
  - 5560:680 Special Topics in Health and Physical Education: Laboratory Instrumentation 3
  - 7400:587 Sports Nutrition 3

- **Electives:** Select at least one (1) course from among the following and have advisor approval.
  - 5560:695 Field Experience: Master’s
  - 5550:698 Master’s Problem 2
  - 5550:699 Master’s Thesis 2

**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 Cultural Foundations of Education 3
  - 5100:624 Psychology of Early Adolescence 3
  - 5200:760 Curriculum Development in Middle School 2
  - 5300:625 Reading Programs in Secondary School 3
  - 5300:780 Philosophy and Organization of Middle School 2
  - 5600:525 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 advisor 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.**
  - 5300:780 Seminar in Secondary Education: Improvements of Instruction in the area of concentration 2

- **Ten credits from the following:**
  - 5300:619 Secondary Curriculum and Instruction 2
  - 5300:625 Reading Programs in Secondary Education 3
  - 5300:685 Field Experience 1
  - 5300:686 Master’s Thesis 1
  - 5300:688 Supervision of Instruction 2
  - 5300:780 Seminar: Secondary Education* 2

- **5400:506 Occupational Education for Youth and Adults 3**

- **Area of concentration (500 level or above) – 10 credits**

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 3
  - 5100:604 Topical Seminar in the Cultural Foundations of Education 3
  - 5100:620 Behavioral Bases of Education 3
  - 5100:642 Topical Seminar in Measurement and Evaluation 3
  - 5100:699 Field Experience: Master’s 1

- **Secondary Education Seminar (2 credits):**
  - 5300:780 Seminar in Secondary Education 2

- **Secondary Education (16):**
  - 5500:695 Field Experience: Master’s 1
  - 5300:530 Instructional and Management Practices 3
  - 5300:619 Secondary School Curriculum and Instruction 2
  - 5300:621 Supervision of Instruction in the Secondary School 2
  - 5300:780 Seminar in Secondary Education 2
  - 5300:625 Advanced Microcomputer Applications in the Secondary Schools 3
  - 5300:629 Reading Programs in Secondary Schools 3
  - 5300:697 Independent Study 3
  - 5300:698 Field Experience: Master’s 1

- **Area of Concentration (9):**
  - Select 9 credits at 500-level or above.
  - 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 private agencies engaged in the education and training of technicians and middle-level workers. The major requires completion of 32 credits.

*Only two seminars for this option may be counted toward the degree.

**Program**

- **Foundation Studies – nine credits:**

- **Professional technical education courses:**
  - 5400:505 Occupational Education for Youth and Adults 3
  - 5400:510 The Two-Year College 3
  - 5400:530 Curriculum Development in Technical Education 2
  - 5400:535 Instructional Techniques in Technical Education 4

- **Teaching Internship:**
  - The student entering the program without teaching experience is required to take a teaching internship at a cooperating two-year institution.
  - 5400:690 Internship: Teaching Vocational Education 2
  - 5400:691 Internship: Teaching Technical Education 2
  - 5400:692 Internship: Post-Secondary Education 2

- **Elective credits (zero to four credits) may support the field of specialization, add to general education, or be professional education courses.**

- **A comprehensive examination is required.**

**Options** (Select one for a total of 8-13 credits.)

**Teaching**

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.
Guidance Option A (must be followed in sequence)

5600:643 Counseling: Theory and Philosophy  
5600:651 Techniques of Counseling  
5600:675 Group Counseling  
5600:675 Practicum in Counseling  

Guidance Option B

5600:635 Community Counseling  
5600:647 Career Counseling: Theory and Practice  
5600:645 Group Testing in Counseling  

Select one of the following:

5600:649 Counseling and Personnel Services in Higher Education  
5600:526 Career Education  
5600:610 Counseling Skills for Teachers  

Curriculum and Supervision

5700:609 Principles of Curriculum Development  
5700:610 Principles of Educational Supervision  

Elective in Curriculum or Supervision

Vocational Home Economics - Family Life (eight to nine credits)

Vocational Home Economics - Child Care and Development (Job Training Specialization) (eight to nine credits)
**College of Business Administration**

James E. Inman, J.D., Interim Dean
Kenneth E. Mast, D.B.A., Assistant Dean and
Director of Undergraduate Programs
John Daniel Williams, D.B.A., Assistant Dean and
Director of Graduate Programs

**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, and Master of Accounting. The college 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 1956, graduate studies in business were begun. Both the undergraduate 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 500 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 fulltime to complete the master's program in a shorter period.

**Admission**

**Policy**

The applicant must meet one 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 undergraduate grade-point average (UGPA) (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 36 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. Applicants are expected to score at least in the 50th percentile on the GMAT – approximately 450 – in order for an offer of admission to be extended.

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 (institution code 1923). Since the GMAT test is administered world-wide only four times per year, the applicant should register for it sufficiently in advance to file the graduate application, so evaluation for admission will not be delayed. GMAT registration bullets can be obtained from the Graduate Programs in Business Office or the Educational Testing Service, Box 8660, Princeton, N.J. 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 only four times, approximately four weeks after each GMAT date. The applicant will be informed in writing of the GAC's decision after approximately one week.

**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.

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3250:600</td>
<td>Foundation of Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>6200:651</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>6400:652</td>
<td>Managerial Finance</td>
<td>3</td>
</tr>
<tr>
<td>6600:655</td>
<td>Government and Business</td>
<td>3</td>
</tr>
<tr>
<td>6500:660</td>
<td>Management and Organizational Behavior</td>
<td>3</td>
</tr>
<tr>
<td>6900:601</td>
<td>Quantitative Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>6300:602</td>
<td>Computer Techniques for Management</td>
<td>3</td>
</tr>
<tr>
<td>6700:600</td>
<td>Marketing Concepts</td>
<td>3</td>
</tr>
<tr>
<td>6800:610</td>
<td>Accounting Management and Control</td>
<td>3</td>
</tr>
<tr>
<td>6400:674</td>
<td>Financial Management and Policy</td>
<td>3</td>
</tr>
<tr>
<td>6500:670</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>6600:623</td>
<td>Strategic Marketing Management</td>
<td>3</td>
</tr>
</tbody>
</table>

- Professional Core (4 credits):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>6700:690</td>
<td>Professional Responsibility</td>
<td>4</td>
</tr>
<tr>
<td>6700:692</td>
<td>International Business</td>
<td>4</td>
</tr>
<tr>
<td>6700:694</td>
<td>Applied Business Documentation and Contact</td>
<td>1</td>
</tr>
<tr>
<td>6700:695</td>
<td>Special Topics in Professional Development</td>
<td>1</td>
</tr>
</tbody>
</table>

- Quantitative Tools (3 credits):

  Student must complete one of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>6200:664</td>
<td>Research and Quantitative Methods in Accounting</td>
<td>3</td>
</tr>
<tr>
<td>6400:659</td>
<td>Accounting Costs and Prices</td>
<td>3</td>
</tr>
<tr>
<td>6500:662</td>
<td>Applied Operations Research</td>
<td>3</td>
</tr>
<tr>
<td>6600:640</td>
<td>Business Research Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

- Concentration (8 credits):

  The student must select 8 credits in each of concentration (accounting, finance, management, marketing, international business.)

- Free Electives (3 credits):

  Student must select 3 credits of free electives outside area of concentration. Approval of Director is required.

- Integrative (3 credits):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>6500:696</td>
<td>Business Strategy and Policy</td>
<td>3</td>
</tr>
</tbody>
</table>

- **Program Summary**

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Core</td>
<td>24</td>
</tr>
<tr>
<td>Functional Core</td>
<td>12</td>
</tr>
<tr>
<td>Professional Core</td>
<td>4</td>
</tr>
<tr>
<td>Quantitative Tools</td>
<td>3</td>
</tr>
<tr>
<td>Concentration</td>
<td>9</td>
</tr>
<tr>
<td>Free Elective</td>
<td>3</td>
</tr>
<tr>
<td>Integrative</td>
<td>3</td>
</tr>
<tr>
<td>Total Program</td>
<td>58</td>
</tr>
</tbody>
</table>

If the Foundation Core Courses are all waived, the program is 34 credits in length.

**Notes:**

1. International Business concentration requires reading and conversational proficiency in one language other than English.
Master of Science in Accounting

The Master of Science in Accounting program is designed to give the student additional exposure to the functional areas of business plus an advanced concentration in accounting. However, the School of Accountancy has made the Master of Science in Accounting program inactive, and no candidates will be admitted to this program until further notice.

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 and complex 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 is structured in two phases of course work: Phase I: foundation course, and Phase II: required courses. A minimum of 30 semester credits is required for the degree. The foundation Phase I course may be waived for those who have had recent study in the subject area.

Phase I

• Postbaccalaureate Foundation:

6200:403030 Taxation I

Phase II

• Required:

6200:620 Basic Tax Research
6200:621 Corporate Taxation I
6200:622 Taxation of Transactions in Property
6200:633 Estate and Gift Taxation

• Electives (Choose two):

Twenty credits of which at least 14 must be in taxation, 6200:64-693

Taxation courses
Any CBA courses
Total Required Credits

Master of Science in Management

The Master of Science in Management program allows students to concentrate their advanced study in one of five areas: quality management, information systems management, health services management, human resource management, and materials 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, engineers, science and math undergraduate majors may choose to concentrate in quality of materials management while computer science majors may prefer information systems management. Psychology majors would benefit from the human resource management concentration, and the health services option is a natural enhancement for anyone with special interest in the health field.

The Master of Science in Management program consists of two phases of courses. Phase I courses offer a basic foundation in business (24 credits). These courses may be waived if the student has completed prior study in each area. Phase II courses (36 credits) form the core of the M.S. program, including the concentration in a specific area of study.

Phase I

• Foundation

3250:600 Foundation of Economic Analysis
6200:601 Financial Accounting
6400:602 Managerial Finance
5400:655 Government and Business
6500:600 Management and Organizational Behavior
6500:601 Quantitative Decision Making
6500:602 Computer Techniques for Management
6600:600 Marketing Concepts

Phase II

• Business Courses:

6200:610 Accounting Management and Control
6400:674 Financial Management and Policy
6500:663 Organizational Theory
6500:640 Management Information Systems
6500:662 Organizational Behavior
6600:640 Applied Operations Research
6600:695 Business Strategy and Policy: Domestic and International

Options:

Choose a concentration from the following:

Quality Management

• Core Courses:

6500:651 Productivity and Quality of Workplace Issues
6500:653 Applied Industrial Statistics
6500:654 Applied Industrial Statistics II
6500:673 Quality and Productivity Techniques
6500:674 Advanced Quality and Productivity Techniques

• Concentration Courses:

6600:641 Applied Data Management
6600:646 Advanced Management Information Systems
6600:672 Manufacturing and Operations Analysis

• Concentration Electives (Choose two):

6600:642 Systems Simulation
6600:643 Expert Systems in Business
6600:644 Managerial Decision Support Systems
6600:676 Project Management

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.

Human Resource Management

• Core Courses:

6500:651 Productivity and Quality of Workplace Issues
6500:653 Applied Industrial Statistics
6500:654 Applied Industrial Statistics II
6500:673 Quality and Productivity Techniques
6500:674 Advanced Quality and Productivity Techniques

• Concentration Courses:

6600:641 Data Management
6600:642 Systems Simulation
6600:651 Productivity and Quality of Workplace Issues
6600:673 Quality and Productivity Techniques
6600:676 Project Management

Materials Management

• Core Courses:

6500:651 Productivity and Quality of Workplace Issues
6500:653 Applied Industrial Statistics
6500:654 Applied Industrial Statistics II
6500:673 Quality and Productivity Techniques
6500:674 Advanced Quality and Productivity Techniques

• Concentration Courses:

6600:641 Data Management
6600:642 Systems Simulation
6600:651 Productivity and Quality of Workplace Issues
6600:673 Quality and Productivity Techniques
6600:676 Project Management

**Students with sufficient managerial accounting background must elect another accounting course to substitute for 6500:640, and such electives must be approved by the director of graduate programs in business. For each six credits of Phase I coursework completed, three credits of Phase II coursework may be waived from the course designated with an asterisk as determined by the director of graduate programs in business. Maximum of six credits to be waived.

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 28 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 105 (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.
**College of Fine and Applied Arts**

Linda Moore, Ph.D., Dean  
DuWayne H. Hansen, D.M.E., Associate Dean  
William H. Seaton, Ph.D., Associate Dean

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**M.A.S.T.E.R.'S DEGREE**

**Home Economics and Family Ecology**

A program of study is offered leading to the Master of Arts in Home Economics and Family Ecology degree with an emphasis in child development: child life; clothing, textiles and interiors; family development; food science; and nutrition/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.
- Take the Graduate Record Examination within the five-year period prior to seeking admission.
- Submit a letter of personal career goals.
- Offer two letters of recommendation if desired.

The graduate faculty of the School of Home Economics 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 in one of the six options, 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 the student's professional goals. These courses will be selected in consultation with and approval from the student's Faculty adviser.

- Complete a thesis or an internship. 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 research may involve a creative historical or experimental design. The internship option involves the design, implementation and evaluation of original and creative programs and/or resource materials pertaining to family and/or child development. Part of the internship experience may take place in a community-based agency which serves families and/or children. A written proposal for the thesis or internship option must be submitted at the completion of approximately 20 credits of graduate study.

- 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 internship.

- Pass an oral examination covering the thesis or internship report.

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**Foundation Courses**

Required by all program options:

- 7400:504 Orientation to Graduate Studies in Home Economics and Family Ecology

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**Child Development Option**

Core Courses:

- 7400:695 Developmental Parent-Child Interactions
- 7400:696 Child Development Theories
- 7400:697 Development in Infancy and Early Childhood

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**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
- 7400:504 Adolescence in the Family Context
- 7400:542 Human Sexuality
- 7400:544 Public Policy and American Families
- 7400:546 Before and After School Child Care
- 7400:560 Organization and Supervision of Child-Care Centers
- 7400:596 Parent Education
- 7400:627 Family Dynamics
- 7400:651 Infant and Child Nutrition
- 7400:660 Programming for Child-Care Centers

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**Cognate Electives**

Select 7 credits with approval of adviser from courses within the School of Home Economics and Family Ecology OR from a cognate area outside the School of Home Economics and Family Ecology OR from a combination of the above.

- Internship or Thesis (Select One):
  - 7400:696 Internship
  - 7400:699 Master's Thesis

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**Child Life Option**

Core Courses:

- 7400:551 Child in the Hospital
- 7400:555 Practicum: Establishing and Supervising a Child Life Program
- 7400:696 Orientation to the Hospital Setting

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
- 7400:504 Adolescence in the Family Context
- 7400:542 Human Sexuality
- 7400:544 Public Policy and American Families
- 7400:546 Before and After School Child Care
- 7400:560 Organization and Supervision of Child-Care Centers
- 7400:596 Parent Education
- 7400:627 Family Dynamics
- 7400:651 Infant and Child Nutrition
- 7400:660 Programming for Child-Care Centers
- 7400:665 Development in Infancy and Early Childhood
- 7400:699 Research course selected with approval of adviser

Cognate Electives:

Select 10 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 above.

- Internship or Thesis (Select One):
  - 7400:696 Internship
  - 7400:699 Master's Thesis

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**Clothing, Textiles and Interiors Option**

Core Courses:

- 7400:624 Materials Culture Studies
- 7400:629 Theories of Fashion
- 7400:677 Social Psychology of Dress and the Body Environment

Options Electives:

- 7400:518 History of Furnishings and Interiors I
- 7400:519 History of Furnishings and Interiors II
- 7400:537 Professions: Image Analysis
- 7400:525 Professional Image Analysis
- 7400:527 Advanced Textiles
- 7400:533 Textile and Apparel Industry
- 7400:535 Principles of Textile Design
- 7400:536 Textile Conservation
- 7400:537 History of Western Costume to 1900
- 7400:538 Problems in Design
- 7400:696 Individual Investigation in Home Economics and Family Ecology

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 above.

- Internship/Thesis Master's Project (Select One):
  - 7400:694 Master's Project
  - 7400:695 Internship
  - 7400:699 Master's Thesis

Total: 40

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### Family Development Option

**Core Courses:**
- 7400:502 Family Life Patterns in the Economically Depressed Home 3
- 7400:504 Adolescence in the Family Context 3
- 7400:506 Family Financial Management 3
- 7400:540 Family Crisis 3
- 7400:542 Human Sexuality 2
- 7400:545 Public Policy and American Families 3
- 7400:546 Culture, Ethnicity and the Family 3
- 7400:556 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

- **Internship or Thesis (Select one):**
  - 7400:696 Internship 5
  - 7400:699 Master's Thesis 5
  - Total 40

### Food Science Option

**Core Courses:**
- 7400:574 Analysis of Food 3
- 7400:576 Developments in Food Science 3
- 7400:580 Experimental Foods (if taken at the undergraduate level, choose 3 additional credits from option electives) 3
- Total 9

- **Option Electives:**
  Select 9-12 credits with approval of adviser from among the following:
  - Food Plants 2
  - Special Topics: Economic/World Food Problems 4
  - Cultural Dimensions of Food 3
  - Seminar in Home Economics and Family Ecology: Topics in Food Science 2
  - The Food Industry, Analysis and Field Study 3
  - Advanced Food Preparation 3
  - Nutrition in the Life Cycle 3
  - Advanced Human Nutrition I 3
  - Advanced Human Nutrition II 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 above.

### Nutrition/Dietetics Option

**Core Courses:**
- 7400:624 Advanced Human Nutrition I 3
- 7400:625 Advanced Human Nutrition II 3

- **Option Electives:**
  Select 9-12 credits with approval of adviser from the following:
  - Pharmacology 3
  - Human Physiology 4
  - Human Pathology 4
  - Biochemistry Lecture I 3
  - Biochemistry Lecture II 3
  - Social Gerontology 3
  - Techniques of Counseling 3
  - Management and Production Concepts 3
  - Computer Techniques for Management 3
  - Experimental Foods 3
  - Nutrition in the Life Cycle 3
  - Cultural Dimensions of Foods 3
  - Analysis of Food 3
  - Developments in Food Science 3
  - Community Nutrition I - Lecture 3
  - Community Nutrition I - Clinical 1
  - Community Nutrition II - Lecture 3
  - Community Nutrition II - Clinical 1
  - Sports Nutrition 3
  - Nutrition in Diminished Health 3
  - Practionets 3

- **Cognate Electives:**
- Select 8-10 credits with approval of adviser from within the School of Home Economics and Family Ecology OR from a cognate area OR from a combination of the above.

### 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.
- 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 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 Meyerbeer/Strauss) 2
- 7500:619 Theory Pedagogy 2

- **Major required courses – 21-23 credits:**
  - 7500:801 Choral Literature 2
  - 7500:818 Musical Styles and Analysis IV (20th Century) 2
  - 7500:824 Historical Survey of Music of the 20th Century 2
  - 7500:847 Master's Chamber Recital 1
  - 7510:699 Master's Thesis 4-6
  - 7510:706 — Ensemble participation in two ensembles required 2
  - 7520:642 Applied Composition 8

- **Additional music courses – zero to two 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
  7500:615 Master's Thesis 4-6

- Additional music/education courses – select 17-19 credits with approval of music education and graduate advisers
  7500:697 Advanced Problems in Music Education 2-4
  7510:614 Keyboard Ensemble (participation in two ensembles required)**
  7500:556 Additional Music/education courses - select 17-19 credits with approval of music education and graduate advisers
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2

- Required courses – 23-26 credits:
  Select either 7500:562 or 7500:613
  7500:652 Recitative and Pedagogy; Organ 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
  7500:656 Advanced Song Literature 3
  7500:658 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
  7520:616 Applied Music (solo, organ and/or harpsichord) 1

- Additional music courses – select 2 to 3 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.

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
  7500:697 Advanced Problems in Music Education 2-8
  7510:614 Ensemble 1-2
  7500:615 Musical Styles and Analysis 2-4
  7520:614 Music History Survey 2-4
  5100:616 Educational Foundations 2-4
  5200:616 Elementary Education 2-4
  5300:616 Secondary Education 2-4

Music History and Literature Option

- Music core courses – eight credits (to be selected):
  7500:556 Advanced Conducting; Instrumental 2
  7500:556 Advanced Conducting; Choral 2
  7500:565 Musical Styles and Analysis I (20th Century) 2
  7510:616 Ensemble (participation required)* 2
  7500:697 Advanced Problems in Music 4

- Major required courses – 20-22 credits:
  7500:651 Introduction to Musicology 2
  7500:653 Bibliography and Research 2
  7500:621 Historical Survey: Music of the Middle Ages and Renaissance 2
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2
  7500:697 Advanced Problems in Music 4
  7500:699 Master's Thesis 4-6

- Additional music courses – two to four credits
  7500:655 Advanced Conducting; Choral 2
  7500:655 Advanced Conducting; Choral 2
  7500:615 Musical Styles and Analysis I (Choral through Early Christian) 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 Historical Survey: Music of the Middle Ages and Renaissance 2
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2
  7500:625 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.

Degree total: 34-36 credits

Performance Option in Accompanying

- Music core courses – eight credits (to be selected):
  7500:556 Advanced Conducting; Instrumental 2
  7500:556 Advanced Conducting; Choral 2
  7500:615 Musical Styles and Analysis I (Choral through Early Christian) 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 Historical Survey: Music of the Middle Ages and Renaissance 2
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2

- Major required courses – 16-18 credits:
  7500:615 Musical Styles and Analysis I (Choral through Early Christian) 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 Historical Survey: Music of the Middle Ages and Renaissance 2
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2

- 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):
  7500:556 Advanced Conducting; Instrumental 2
  7500:556 Advanced Conducting; Choral 2
  7500:615 Musical Styles and Analysis I (Choral through Early Christian) 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 Historical Survey: Music of the Middle Ages and Renaissance 2
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2

- Major required courses – 16-18 credits:
  7500:615 Musical Styles and Analysis I (Choral through Early Christian) 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 Historical Survey: Music of the Middle Ages and Renaissance 2
  7500:622 Historical Survey: Music of the Baroque 2
  7500:623 Historical Survey: Music of the Classic and Romantic Eras 2
  7500:624 Historical Survey: Music of the 20th Century 2

- 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.
**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 16 semester credits of undergraduate communication coursework approved by the department.

**Program requirements:**
- Complete 26 credits, distributed as follows:
  - School core courses - 16 credits:
    - 7800:630 Introduction to Graduate Study in Mass Media Communication
    - 7800:631 Empirical Research in Mass Media Communication
    - 7800:634 Survey of Communication Theory
  - Master's Thesis - 6 credits
  - Elective courses - six credits.
  - Complete a qualifying exam over 24 credits of coursework.
  - Be advanced to candidacy.
  - Register for at least four credits for thesis/project/production (may only be done after successful completion of qualifying exam).
  - Present and defend a thesis/project/or production.

The requirement is designed to be the culmination of the student’s academic program and involves the conception, design and execution of an academic problem in a manner which requires a high level of substantive, methodological and writing skills. These skills may be demonstrated in any of three types of activity, depending on the student’s background and orientation.

### Theatre Arts

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 equitable work, as approved by the coordinator of the graduate theatre program.

**Course Requirement**
- Complete a minimum of 36 credits from one of the following courses of study.

#### Acting/Directing Course of Study

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>7800:600</td>
<td>Introduction to Graduate Studies</td>
<td>3</td>
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<tr>
<td>7800:606</td>
<td>Lighting Design</td>
<td>3</td>
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<tr>
<td>7800:611</td>
<td>Seminar in Stage Costume Design</td>
<td>3</td>
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<tr>
<td>7800:612</td>
<td>Seminar in Scene Design</td>
<td>3</td>
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<tr>
<td>7800:613</td>
<td>Problems in Directing</td>
<td>3</td>
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<tr>
<td>7800:645</td>
<td>Seminar in Dramatic Literature</td>
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<td>7800:646</td>
<td>Graduate Acting Techniques</td>
<td>3</td>
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<tr>
<td>7800:647</td>
<td>Graduate Acting Styles</td>
<td>3</td>
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<tr>
<td>7800:658</td>
<td>History of Theatre</td>
<td>2</td>
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<tr>
<td>7800:699</td>
<td>Master's Thesis</td>
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<tr>
<td>7800:705</td>
<td>General Theatre Electives</td>
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</table>

#### Design/Technology Course of Study

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>7800:600</td>
<td>Introduction to Graduate Studies</td>
<td>3</td>
</tr>
<tr>
<td>7800:638</td>
<td>Advanced Problems in Lighting</td>
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<td>7800:641</td>
<td>Problems in Directing</td>
<td>3</td>
</tr>
<tr>
<td>7800:646</td>
<td>Graduate Acting Techniques</td>
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<td>6</td>
</tr>
<tr>
<td>7800:705</td>
<td>General Theatre Electives</td>
<td>9</td>
</tr>
</tbody>
</table>
General M.A. Course of Study - History, Literature, Criticism

7800:657 Contemporary Theatre Styles 3
7800:660 Introduction to Graduate Studies 3
7800:661 Problems in Directing 3
or 7800:662 Seminar in Scene Design 3
7800:665 Seminar in Dramatic Literature 3
7800:666 Principles of Arts Management 3
7800:682 Fund Raising and Grantmanship in the Arts 3
7800:691 Arts Administration: Practice and Policy 3
7800:692 Legal Aspects of Arts Administration 3
7800:698 Internship 3-6
7800:699 Master's Thesis 6 credits required 6-6

• Required theatre arts courses (29-32 credits):
  7800:660 Introduction to Graduate Studies in Theatre Arts 3
  7800:665 Colloquium in the Arts 2
  7800:666 Audience Development 3
  7800:682 Fund Raising and Grantmanship in the Arts 3
  7800:691 Arts Administration: Practice and Policy 3
  7800:692 Legal Aspects of Arts Administration 3
  7800:698 Internship 3-6
  7800:699 Master's Thesis 6 credits required 6-6

• Electives in related fields (4-7 credits):
  Options here include course work in business, computer science, urban studies, music.

• Complete an oral defense of the thesis.

General Electives 0-3

Communicative Disorders

This program, leading to the M.A. in Communicative Disorders, is designed to lead to professional certification by the American Speech-Language-Hearing Association (ASHA) in speech language pathology and/or audiology and/or licensure by the State of Ohio Board of Speech 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 upon meeting requirements. Deadline for assistantship applications is March 1.

Degree Requirements

• Successfully complete a course of study with a minimum of 34 credits, including thesis - or with a minimum of 38 credits and comprehensive examinations for the non-thesis option. The student anticipating dual ASHA certification in speech pathology and audiology may need to complete eight or more additional credits in the non-thesis option. Academic requirements within the school include:
  7700:611 Research Methods in Communication Disorders I 3
  7700:612 Research Methods in Communicative Disorders II 2
  or 7700:650 Advanced Clinical Practicum: Differential Diagnosis 1
  7700:696 Master's Thesis 46
  7700:656 Advanced Clinical Practicum: Language 1

Two credits must be taken from the following:

7700:651 Advanced Clinical Practicum: Voice 1
7700:652 Advanced Clinical Practicum: Fluency 1
7700:654 Advanced Clinical Practicum: Diagnostic Audiology 1
7700:655 Advanced Clinical Practicum: Articulation 1
7700:656 Advanced Clinical Practicum: Language 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 pathology, and the speech pathology student must take 4 credits in audiology. It is recommended that the speech pathology major elect 7700:639 Advanced Clinical Testing as the first of the audiology courses.
• The following limitations on work toward the degree may be exceeded only with the approval of two-thirds of the department'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 (5610:693 or 5610:692) 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

There is no graduate degree in social work. A student interested in course work may enroll in Graduate School through other programs or may apply for non-degree status through the School of Social Work. A student should enroll in graduate courses only for specific professional preparation and with the permission of the instructor. Courses assume a background in social welfare institutions, social work practice, social welfare policy and history. Inquiries should be directed to the director of the School of Social Work.
The College of Nursing

V. Ruth Gray, R.N., Ed.D., Dean
Dolores Bovery, R.N., Ph.D., 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

**MASTER OF SCIENCE IN NURSING**

**Philosophy**

The College of Nursing, an integral part of The University of Akron, accepts the responsibility for promoting the general mission of the University, which is dissemination and pursuit of knowledge, the nurturing of intellectual curiosity, the search for truth and a conscious effort to serve the nursing student in the urban and rural community.

The College of Nursing faculty believe that the foot 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 interacts 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, valuing being.

Families are individuals dynamically connected with each other over time. Family configurations may be traditional or nontraditional.

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 affecting personal health.

Environment includes all living and nonliving dimensions with which the individual, family and community have interactions. The dynamic, environmental interactions 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 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 practice of nursing occurs in a variety of settings. The role of the nurse involves the exercise of social and cultural responsibilities, including accountability for professional actions and provision of quality nursing care.

Education is an individualized, life-long process. Learning is a continual process and includes the individual's interactions with the environment. Knowledge, acquisition, development of critical thinking and self-expression enable 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. Learning 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 the nursing process in practice. 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 preparation and is a foundation for doctoral study. Graduate education provides advanced learning to prepare specialists, educators and administrators in the practice of nursing. College of Nursing graduate students analyze and use a variety of theoretical formulations and research findings in advanced practice as well as plan and conduct research with guidance. The students develop expertise through self-direction, peer relations, personal valuing and faculty modeling and facilitation.

**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 roles.
- 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.

**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 500 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.

**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 settings. Areas of concentration include Adult Health Nursing, Child and Adolescent Health Nursing, Gerontological Nursing, and Family Health Nursing. Students are prepared for advanced practice roles in education, administration or clinical nurse specialization. The curriculum is based on theory and research both in nursing and in related disciplines. It provides the foundation of 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 (CRNAs).

**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: 8200:621, Nursing Inquiry I and 8200:689, Master's Thesis or 8200:688, Nursing Inquiry II.

**Advanced Practice Roles**

Options are provided for roles of educator, administrator, or clinical nurse specialist.

*National League for Nursing

**A baccalaureate degree in nursing from a foreign university which is recognized by The University of Akron.
Electives

Students may choose to enroll in cognate electives. The graduate nursing curriculum requires 36 credit hours of study. Additional credits will provide the opportunity to individualize and strengthen the major.

Core courses required of all students:

- Pathophysiological Concepts of Nursing Care 3
- Theoretical Basis for Nursing 3
- Computer Applications in Nursing 2
- Policy Issues in Nursing 2
- Nursing Inquiry 3
- Nursing Inquiry II 4
- Master's Thesis 1

Functional role courses selected by students based upon area of specialty:

- Education.*
  - Nursing Curriculum Development 3
  - Evaluation in Nursing Education 3
  - Practicum: The Academic Role of the Nurse Educator 6

- Administration:
  - Fiscal Management in Nursing Administration 3
  - Resource Management in Nursing Settings 3
  - Organizational Behavior in Nursing Settings 3
  - Practicum: Administration I 5
  - Practicum: Administration II 5

- Nurse Anesthesia**
  - Human Physiology I 4
  - Human Physiology II 4
  - Clinical Practice Seminar 3
  - Pharmacology for Nurse Anesthesia I 3
  - Pharmacology for Nurse Anesthesia II 3
  - Principles of Anesthesia I 4
  - Principles of Anesthesia II 4
  - Professional Role Seminar 2
  - Nurse Anesthesia Residency 0

- Child and Adolescent Health***
  - Child and Adolescent Health Nursing I 3
  - Child and Adolescent Health Nursing II 4
  - Pharmacology for Child and Adolescent Health Nursing 3
  - Child and Adolescent Health Nursing III 4
  - Practicum: Child and Adolescent Health Nursing 3

- Liaison-Community Mental Health Nursing**
  - Psychopharmacology 2
  - Liaison-Community Mental Health Nursing I 4
  - Liaison-Community Mental Health Nursing II 4
  - Liaison-Community Mental Health Nursing III 4
  - Practicum: Liaison-Community Mental Health Nursing 3

Note: The Anesthesia Track is accredited by the Council on Accreditation of Nurse Anesthesia Programs.

- Adult Health
  - Adult Health Nursing I 3
  - Adult Health Nursing II 4
  - Adult Health Nursing III 4
  - Practicum: Adult Health Nursing 3

- Gerontological Nursing***
  - Gerontological Nursing I 3
  - Gerontological Nursing II 4
  - Gerontological Nursing III 4
  - Practicum: Gerontological Nursing 3

- Clinical Nurse Specialization***
  - Advanced Clinical Practice Seminar 2

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*Students in education are required to take an additional 7 credits of Advanced Clinical Practice Seminar.
**In addition to the listed courses, all nurse anesthesia students must complete a 15 month residency.
***Students in Child and Adolescent Health, Liaison 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 admission requirements:

- Current Ohio State license or 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.
- Graduate Record Exam (GRE) taken within the last five (5) years. During the past three years, the range of scores has been: verbal 400-614, quantitative 400-695, and analytical 400-640.
- Three hundred (300) word essay describing professional goals.
- Interview with selected faculty members and submission of a portfolio.
- Computer skills.

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 57 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:

- Health Assessment 3
- Nursing Research 3
- Issues and Roles of the Profession of Nursing 3
- Concepts and Theories of Professional Nursing 3
- Community Health Nursing 4
- Leadership Roles of Professional Nursing 5

***Students in Child and Adolescent Health, Liaison Mental Health, Adult Health, or Gerontological Nursing are required to take the 2 credit hour Advanced Clinical Practice Seminar.
College of Polymer Science and Polymer Engineering

Frank N. Kelley, Ph.D., Dean
Rudolph J. Scavuzzo, Ph.d., Associate Dean

HISTORY
The University of Akron has been a focus for training 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. Whittby, and the UA 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.

DESCRIPTION
The College of Polymer Science and Polymer Engineering carries on 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 syntheses, 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.

ADMISSION REQUIREMENTS
Admissions to the graduate program in the college are competitive. The departmental admission committees carefully consider each applicant. Early application is suggested.

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 may 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.

DOCTOR OF PHILOSOPHY
Students may pursue the Doctor of Philosophy degree in either Polymer Science or Polymer Engineering.

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 credits). Credits for participation in either Polymer Science of 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 U.S. or B.A. typically spend 4 years in residence.

- Completion of 18 credits among the following core courses: 2 cr. each in polymer science:
  - 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

- 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 9871.607A 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 core 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
  • 531 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 competency in computer skills.
• At least 12 credits of graduate coursework and all thesis 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.
• Polymer engineering core:
  • 9841:611 Structural Characterization of Polymers with Electromagnetic Radiation
  • 9841:621 Polymer Science and Polymer Processing
  • 9841:622 Analysis and Design of Polymer Processing Operations I
  • 9841:631 Engineering Properties of Solid Polymers
  • 9841:641 Polymer Materials Engineering Science
  12
• Polymer engineering elective:
  • 9841:601 Polymer Engineering Seminar
  • 9841:623 Analysis and Design of Polymer Processing Operations II
  • 9841:642 Engineering Aspects of Polymer Coatings
  • 9841:651 Polymer Engineering Laboratory
  • 9841:661 Polymerization Reactor Engineering
  3
• Approved engineering and science elective (a minimum of 3 credits of approved science or mathematics required):
  • 4350 Approved Mathematics
  • 4300:651 Advanced Engineering Materials
  • 4620:622 Continuum Mechanics
  • 9871:613 Polymer Science Laboratory
  • 9871:674 Polymer Structure and Characterization
  • 9871:675 Polymer Thermodynamics
  • 3
  • Thesis
  • 9841:699 Master's Thesis
  6
• Requirements:
  • Polymer Engineering Core
  • Approved Electives
  • Approved Mathematics
  • Thesis
  12
  12
  3
  6
  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 in a 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.

APPLIED POLITICS

John C. Green, Ph.D., Director

The Certificate Program, through the Ray C. Bliss Institute of Applied Politics, offers concentrated coursework in the history, organization and management of campaigns intended to influence the outcome of political decisions. This includes as major focus, but is not limited to, efforts to capture elective public office in partisan contests. This program is available to any student who has a deep interest in practical politics. The set of courses comprising the certificate program is also incorporated as a track within the Bachelor of Arts and Bachelor of Science in Public Policy Management Program. Interested students are able to create degree programs with an emphasis on campaign management.

Requirements

Persons are eligible for admission to the Certificate Program in Applied Politics if they have been admitted to study as special, non-degree or full-time students 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 head of the department in which they are enrolled. Students shall seek admission to this program by filing an application with the political science department. The student will schedule courses with the assistance of an advisor in the department.

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3700:540</td>
<td>Public Opinion and Political Behavior</td>
<td>4</td>
</tr>
<tr>
<td>3700:570</td>
<td>Campaign Management</td>
<td>3</td>
</tr>
<tr>
<td>3700:571</td>
<td>Campaign Finance</td>
<td>3</td>
</tr>
<tr>
<td>3700:573</td>
<td>American Political Parties</td>
<td>3</td>
</tr>
<tr>
<td>3700:675</td>
<td>Internship</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

In addition to the core courses, students must complete two of the following elective courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3700:690</td>
<td>Special Topics [Applied Politics Focus]*</td>
<td>3</td>
</tr>
<tr>
<td>3700:697</td>
<td>Independent Study*</td>
<td>3</td>
</tr>
<tr>
<td>3700:702</td>
<td>Politics and the Media</td>
<td>3</td>
</tr>
<tr>
<td>3700:712</td>
<td>American Interest Groups</td>
<td>3</td>
</tr>
<tr>
<td>3700:693</td>
<td>One American Politics Graduate Seminar*</td>
<td>3</td>
</tr>
</tbody>
</table>

Students must maintain at least a 3.0 average in the certificate coursework.

*Students must have prior approval of the Bliss Institute Director.

Certificate

Political science majors at both the undergraduate and graduate level will, upon completion of the program, be awarded a B.A., B.S. or M.S. in Political Science with a Certificate in Applied Politics. Majors in other disciplines will have the certificate noted on their permanent records.

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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3300:576</td>
<td>Seminar: Theory and Teaching of Basic Composition</td>
<td>3</td>
</tr>
<tr>
<td>3300:673</td>
<td>Theories of Composition</td>
<td>3</td>
</tr>
<tr>
<td>3300:675</td>
<td>Seminar Research Methodologies in Composition</td>
<td>3</td>
</tr>
</tbody>
</table>

Optional Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>3300:670</td>
<td>History of the English Language</td>
<td>3</td>
</tr>
<tr>
<td>3300:711</td>
<td>U.S. History: Black and White</td>
<td>3</td>
</tr>
<tr>
<td>3300:589</td>
<td>Grammatical Structures of Modern English</td>
<td>3</td>
</tr>
<tr>
<td>3300:575</td>
<td>Theory of Rhetoric</td>
<td>2</td>
</tr>
<tr>
<td>3300:569</td>
<td>Seminar: Sociolinguistics</td>
<td>3</td>
</tr>
<tr>
<td>3300:570</td>
<td>Modern Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>3300:689</td>
<td>Seminar: Stylistics</td>
<td>3</td>
</tr>
<tr>
<td>3300:689</td>
<td>Seminar: Contextual Linguistics</td>
<td>3</td>
</tr>
</tbody>
</table>

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.

Applicants planning to pursue the certificate must apply by the end of the fall semester. The program is designed to offer a balance between academic and practical training.

Core

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800:601</td>
<td>Divorce Mediation</td>
<td>3</td>
</tr>
<tr>
<td>1800:602</td>
<td>Divorce Mediation Practicum</td>
<td>2</td>
</tr>
</tbody>
</table>

Select at least one from each area:

Law

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>5200:638</td>
<td>Family Law</td>
<td>3</td>
</tr>
<tr>
<td>7400:651</td>
<td>Family Consumer Law</td>
<td>3</td>
</tr>
</tbody>
</table>

Accounting

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>6200:601</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>9200:621</td>
<td>Accounting for Lawyers</td>
<td>3</td>
</tr>
</tbody>
</table>

Family

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>5600:655</td>
<td>Marriage and Family Therapy: Theory and Techniques</td>
<td>3</td>
</tr>
<tr>
<td>5600:667</td>
<td>Mental Therapy</td>
<td>3</td>
</tr>
<tr>
<td>7400:607</td>
<td>Family Dynamics</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

Students who have already completed coursework in Law, Accounting or Family may select from courses listed below:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>5600:647</td>
<td>Career Counseling</td>
<td>3</td>
</tr>
<tr>
<td>5600:688</td>
<td>Systems Theory in Family Therapy</td>
<td>3</td>
</tr>
<tr>
<td>7400:640</td>
<td>Family Crisis</td>
<td>3</td>
</tr>
<tr>
<td>7400:650</td>
<td>Family and Divorce</td>
<td>2</td>
</tr>
<tr>
<td>7400:602</td>
<td>Family in Life Span Perspective</td>
<td>2</td>
</tr>
<tr>
<td>9200:684</td>
<td>Alternate Dispute Resolution</td>
<td>3</td>
</tr>
</tbody>
</table>
GERONTOLOGY

Harvey Steins, Ph.D., Director
Isadore Newman, Ph.D., Associate Director
Raymond E. Sanders, Ph.D., Associate Director of Research
Evelyn Sutton, M.S., Program Coordinator, Gerontology
Jerome Kaplan, Ph.D., Program Coordinator, Nursing Home Administrator Program

Requirements

This certificate program is a special course of study along with undergraduate and 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 helps to meet the critical shortage of trained individuals in the field of gerontology.

The undergraduate and graduate curriculum committees of the institute will oversee this certificate program and certify through the director of the institute that all requirements for the certificate have been completed.

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 credits 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 available gerontology courses or the Office of Geriatric Medicine and Gerontology, NEUCOM.

Admission

To participate in the program, a student should:

• Be formally admitted to The University of Akron as an undergraduate, postbaccalaureate or graduate student.

• Make written application to the program countersigned by student’s major academic adviser.

• Have an interview with a designated faculty member of the Institute for Life-Span Development and Gerontology.

• Receive written notification for admission from the director of the Institute for Life-Span Development and Gerontology.

• Consult with the director or a designated faculty member to formulate a program of study.

Program

Minimum: 18 credits.

Core

3006.680 Interdisciplinary Seminar in Life-Span Development and Gerontology 3
3006.685 Practicum/Internship 3
——— Research Methods Course 3*

Electives

3006.686 Retirement Specialist 2
3006.690 Workshop—Women: Middle and Later Years 2
3006.695 Workshop—Aging: Process and Intervention 2
3750.560 Policy Problems: Aging** 3
3750.720 Psychology Core II: Developmental, Perceptual, Cognitive 4
3750.727 Psychology of Adulthood and Aging 4
3850.678 Social Gerontology 3
3850.681 Cross Clinical Perspectives in Aging 3
5400.541 Educational Gerontology Seminar 3
5400.661 Current Issues in Higher Education: Life-Span and Community Education 3
6500.687 Seminar in Health Services Policy and Administration 2
6500.689 Health Services Systems Management (with permission) 3
7400.602 Family Relationships in Middle and Later Years 3
7400.550 Social Skills and Services for Later Adulthood and Aging 3

* From student’s home department

HIGHER EDUCATION

Dianne Brown-Wright, Ph.D., Coordinator

Requirements

This certificate program in higher education requires a minimum of 15 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 master'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 this admission category should first meet with the director of the Center for the Study of Higher Education. The person wishing to pursue a doctorate in an academic department may concurrently undertake the certificate program as a cognate or minor. Such students must apply to the Graduate School for admission to the academic department and also apply for admission to the Center for the Study of Higher Education and must be admitted to both programs. Applicants wishing to pursue only the certificate program must apply to both programs. Applicants wishing to pursue only the certificate program must apply to the Graduate School for admission as a 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: administrative, 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:

5100.720 Seminar: History and Philosophy of Higher Education 3
5900.700 Introductory Administrative Colloquium in Higher Education 1
5900.800 Advanced Administrative Colloquium in Higher Education 1
5900.801, 2 Internship and Internship Seminar 2
5900.801 Independent Study or course work with supporting concentration and bring total hours to a minimum of 10. 8

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)

5700.704 Advanced Principles of Educational Administration (A) 2
5900.715 Seminar in Higher Education Administration in Higher Education (B) 3

Student Services in Higher Education (II)

5600.649 Counseling and Personnel Services in Higher Education (A) 3
5900.729 Seminar in Higher Education Student Services (B) 3

** The awarding of the 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.

*Offered every other year

Program Planning, Curriculum and Instruction in Higher Education (III)

5900.730 Higher Education Curriculum and Program Planning (A) 3
5900.735 Instructional Strategies and Techniques for the College Instructor (B) 3
5700.609 Principles of Curriculum Development (B) 3
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 the student should:
• Be formally admitted to The University of Akron as an undergraduate, postbaccalaureate or graduate student.
• Make written application to the program countersigned by student’s major academic advisor (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 9-6

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
  5600:656 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
  7400:606 Developmental Parent-Child Interactions 3
  7400:610 Child Development Theories 3

Elective Courses (9 credits)
Select one course from three different disciplines. (Must be outside student’s major degree area)

Specific Skill Areas
• Psychology
  3750:602 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
  5600:592 Multicultural Counseling 1-4
  5600:521 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
  5610:590 Working with Parents of MSPR Individuals 3
  5610:604 Education and Management Strategies for Parents of Exceptional Individuals 3
• Multicultural Education
  5620:582 Characteristics of Culturally Different Youth 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 Resource Management 3
  7400:540 Family Crisis 3
  7400:542 Human Sexuality 3
  7400:546 Culture, Ethnicity, and the Family 3
  7400:590 Family and Divorce 2
  7400:598 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

Peter J. Leahy, Ph.D., Department Head

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 to enrolling 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.
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 advisor 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)
- 3990:601 Advanced Research and Statistical Methods (3)

### Options
#### Geography/Urban Planning
- 3350:630 Introduction to Planning Theory (3)
- 3350:630.1,2 Seminar Urban Planning Design (3)
- 3350:630.1,2 Seminar Planning Theory and Innovation (3 Electives)

#### Public Administration
- 3990:611 Introduction to the Profession of Public Administration (3)
- 3990:640 Fiscal Analysis (3)
- 3990:643 Introduction to Public Policy (3 Electives)

#### Urban Research Methods
- 3990:670 Research for Futures Planning (3)
- 3990:677 Computer Applications in Public Organizations (3 Electives)

#### Urban Service Systems
- 3990:630 Social Services Planning (3)
- 3990:671 Urban Society and Service Systems (3)
- 3990:671 Program Evaluation in Urban Studies (3 Electives)

#### Urban Studies
- 3990:602 History of Urban Development (3)
- 3990:6— Electives (10)

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**PUBLIC POLICY**

Stephen C. Brooks, Ph.D., Chairman, coordinating committee

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 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**
- 3250:530 Human Resource Policy (3)
- 3250:564 Public Finance (3)
- 3250:565 Seminar in Economic Planning (3)

**Political Science**
- 3700:541 The Policy Process (3)
- 3700:542 Methods of Policy Analysis (3)
- 3700:558 Seminar in Public Policy Agendas and Decisions (3)
- 3700:570 Seminar in the Administrative Process (3)

**Sociology**
- 3650:613 Sociology of Program Evaluation and Program Improvement (3)
- 3650:679 Political Sociology (3)

In addition to the courses listed above, each student, after receiving the approval of his or her advisor, 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, 3700:657 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 advisor, 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.

**TEACHING ENGLISH AS A SECOND LANGUAGE**

Kenneth J. Pakenham, Ph.D., Director

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 650.

**Program**
- 3310:573 Seminar in Teaching ESL: Theory and Method (3)
- 3310:599 Special Topics: Grammatical Structures of English (3)
- 5630:581 Multicultural Education in the U.S.** (3)
- 3310:599 Special Topics: Sociolinguistics** (3)
- 5630:587 Techniques for Teaching ESL (3)

*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

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. Undergraduates 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 are not admittable to the program as a non-degree graduate student. Students pursuing a graduate degree will receive their graduate certificate upon completion of the requirements for their graduate degree. 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.

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 the 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. 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>5400:500</td>
<td>The Postsecondary Learner</td>
<td>3</td>
</tr>
<tr>
<td>5400:515</td>
<td>Training in Business and Industry</td>
<td>3</td>
</tr>
<tr>
<td>5400:520</td>
<td>Curriculum Development in Technical Education</td>
<td>2</td>
</tr>
<tr>
<td>5400:531</td>
<td>Curriculum Development for Technical Education Lab</td>
<td>1</td>
</tr>
<tr>
<td>5400:535</td>
<td>Instructional Techniques in Technical Education</td>
<td>4</td>
</tr>
<tr>
<td>5400:691</td>
<td>Internship: Teaching Technical Education</td>
<td>2</td>
</tr>
<tr>
<td>5100:520</td>
<td>Introduction to Computer-Based Education</td>
<td>3</td>
</tr>
</tbody>
</table>

The Internship is the last course taken. This course cannot be taken until all other certificate courses have been completed with a 3.0 GPA or better. 5400:531 and 5400:530 must be taken together and before 5400:535.
Research Centers and Institutes

In the past, colleges and universities have been thought of as ivy-covered storehouses of knowledge where neatly packed information was dispensed to eager students. But this has never been true, for it is here that much of the new knowledge is developed. And with the accelerating tempo of our times, there is an increased call for universities to provide more information to enable society to cope.

The University of Akron is alive to this challenge and has sought to develop its edge in research. And with the accelerating tempo of our times, there is an emphasis on work that is relevant, not on mere knowledge for knowledge's sake. One consequence of the University's concern with relevant research has been the support of interdisciplinary teams that have been put together to tackle specific problems. For instance, problems in connection with water pollution have used the services of chemists, biologists and chemical, mechanical and civil engineers. While the planning and organization of a research project is usually carried out by or with the assistance of a faculty member, both graduate and undergraduate students have the opportunity to participate, depending on the nature of the project and the skills and knowledge required.

Sponsored research activities on campus are coordinated by the Research Council, founded in 1962. It also serves as the policy-making body for research. The council consists of the associate vice president for research and university development, the director of research services and sponsored programs, various college deans, and general counsel.

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, 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 political and social 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.

Institute for Biomedical Engineering Research
Daniel B. Sheffer, 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 research services 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 institutions would 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 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 at the north edge of the campus.

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 clearing house for the gathering and dissemination of economic education materials and programs. It also fosters an understanding and appreciation of the American economic system.

Center for Environmental Studies
Annabelle M. Foos, Ph.D., 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 the Evaluation of Environmental Data. Workshops on energy, natural history and environmental studies in England also emphasize the interdisciplinary approach to the resolution of issues.

The center provides programs of environmental studies in the Cuyahoga Valley National Recreation Area (CVNRA). These programs are operated through the University's Cuyahoga River Interpretive Center. Water research is a major role of the Center.

Center for Family Studies
Helen K. Clemenshaw, Ph.D., Director
Nancy B. Miller, Ph.D., Associate Director of Research

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 in the fields of education, social work, and mental health. 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.

Presently, the Center has two graduate interdisciplinary certificate programs. The Home-Based Certificate program is funded by grant monies from the Ohio Department of Mental Health. The Divorce Mediation certificate program has received research funds from the Ohio Supreme Court and the Ohio Commission on Dispute Resolution and Conflict Management.

The center is staffed by faculty from five colleges and over fifteen disciplines. It also includes leaders from various community systems, such as the schools, hospitals, community service organizations and mental health and social work 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. Presently, the Center has a fellow in residence.

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.

Training Center for Fire and Hazardous Materials
David H. Hoover, M.S., 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 services 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.

Institute for Futures Studies and Research
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 Futures 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 arena. It cooperates with the Center for Urban Studies and other research institutes.

Instituted in 1987, the Ohio Policy Issues Network (OPIN) continues to research and analyze emerging policy issues in the state of Ohio. Furthermore, in 1990, the OPIN began to provide and disseminate viable options to a diverse range of policy problems. The bimonthly publications of the Ohio Policy Issues Network are the OPIN Policy Book, Ohio Forecasts and the Issues Analysis Report.
More recently, the Institute has undertaken initiatives relating to international activities and global studies, with a focus on education, economic and political change as well as policy development. The Institute has cooperated with the U.S. Peace Corps in both Washington, D.C. and Africa on its new urban initiatives. An Ohio-Quebec Urban Symposium was conducted in 1990 as an effort to continue promoting Great Lakes collaboration and Canadian studies. Discourses have been held in several Eastern European countries concerning urban planning and future studies. In these emerging activities, the Institute encourages involvement and cooperation of faculty, staff, and students from a variety of disciplines.

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.

Institute for Life-Span Development and Gerontology

Harvey L. Sterns, Ph.D., Director
Isadore Newman, Ph.D., Associate Director
Raymond E. Sanders, Ph.D., Associate Director for Research
Evelyn Sutton, M.A., Program Coordinator
Gerontology Certificate Program
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 Northeast Ohio Consortium on Geriatric Medicine and Gerontology, joining together with the Office of Geriatric Medicine and Gerontology, Northeastern Ohio Universities College of Medicine, Gerontology Center, Kent State University, and Gerontology Committee, Youngstown State University.

Center for Nursing

Maryhelen Kreidler, Ed.D., R.N., Director
Martha Conrad, M.S.N., R.N., Assistant 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.

Center for Peace Studies

Hon. John F. Seiberling, LL.B., Director

The Center for Peace Studies provides students with the opportunity for an interdisciplinary course of study in one of the related fields of international peace, 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.

Joint Center for Policy Research

Shara L. Davis, M.A., Director

Designed as a partnership between the University of Akron's Center for Urban Studies (CUS) and Lorain County Community College's Public Services Institute, the Joint Center for Policy Research (JCPRI) combines the energies of research faculty, staff and graduate students of a state university with the strong commitment of a community college responding to local needs.

The Joint Center's primary mission is to serve the Lorain County community-lead­ers, nonprofits, organizations, government agencies, and citizens-and to extend the college's commitment to local economic development. In addition, its services are provided on a regional level.

In its third year of operation, the services being offered upon request are: Customized Policy Research and Consultation; Data Service Delivery System; and Capacity Building. Customized policy research and consultation services involve the collection of qualitative and quantitative information utilizing various data gathering techniques, primarily survey research and focus group techniques. The data service delivery system involves the sharing of information from sources including the 1990 Census data as well as data from other JCPRI and CUS research endeavors. Capacity building involves training and empowering organizations with the ability to facilitate their own qualitative information collection and to use that information through the decision making process. The Joint Center carries out its projects by drawing upon the full services of the CUS Research Lab.

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 characteristics. The institute, founded in 1983, seeks to be a major intellectual and research resource in northeast Ohio. The institute maintains up-to-date and future-oriented 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.

The Maurice Morton Institute of Polymer Science

Darrel H. Reneker, Ph.D., Director

The Institute of Polymer Science is concerned with basic and applied research in polymers. It was established in 1956 as the Institute of Polymer Science. The University's first Ph.D. program in polymer chemistry was started in 1968 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.

Research Centers and Institutes 63

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 mini pilot 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.

Small Business Institute

Joseph C. Latona, Ph.D., Director

The Small Business Institute was established in 1973 and was the first Small Business Institute funded in Northern Ohio. The Small Business Institute's objective is to offer management assistance counseling to area organizations through the utilization of senior students in the College of Business Administration, working as advisers under the supervision of College of Business Administration faculty. Nearly 600 firms have been serviced by the Institute since its founding. It is an integral part of the Akron Summit Industrial Incubator project.

Research Centers and Institutes 63
Survey Research Center

Jesse F. Marquette, Ph.D., Director
Anne-Marie Scarisbrick-Hauser, Ph.D., Associate Director

The University of Akron Survey Research Center is a research organization established with the prime objective of making quality survey research facilities available to university personnel, national state, community and other legitimate research agencies. The Center 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. Center staff are available for consultation in the development of grant proposals and budgets.

The Survey Research Center has been in continuous operation at The University of Akron since 1982, utilizing research and professional staff, graduate assistants, and over 50 regular interviewers. Most of the work done by the Center is on behalf of the government or non-profit agencies and mass media organizations such as newspapers and television stations. The Center's work, both directly and indirectly, influences public discussion and planning on significant social and political issues. The Survey Research Center has, since its inception processed more than 80,000 completed interviews in over 100 projects concerned with topics such as national or state political and social issues, government services, economic development, and public policy planning.

Center for Urban Studies

James L. Shanahan, Ph.D., Director
Gail A. Sommers, M.A., Assistant Director
Elizabeth Dahl Voth, M.A., Assistant Director for Administration

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.

Since 1979, the Center has been the University's representative to the Ohio Board of Regents' Urban University Program (UUP) which links eight state universities to help Ohio meet the challenges of its urban future. UUP's Northeast Ohio Inter-Institutional Research Consortium focuses on the revitalization of the region through the efforts of the faculty and staff of the four urban universities in Northeast Ohio.

Over the years, the Center has expanded its programs and services, building a substantial intellectual and technological infrastructure. The majority of the Center's research and services is supported by external grants and contracts which represent UUP funding for multiyear projects, multi-campus projects, and faculty research projects as well as funding from private sources for client-driven research and services.

CUS activities are organized under three broad programs: Public Policy Issues Program; Public Sector Marketing Research and Data/GIS Services Program; and Community Institution and Leadership Building Program. Increasingly, these areas are becoming distinct programs, each with its own program head, professional staff, and affiliated faculty from various disciplines and professions.

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.

Linked with CUS is another important center: the Joint Center for Policy Research, an innovative partnership with the Public Services Institute at Lorain County Community College which is intended to serve the needs of Lorain County for policy research services.
# Course Numbering System*

**INDEX**

**Department of Developmental Programs**

1020 Developmental Programs

**English Language Institute**

1030 English Language Institute

**University College**

1100 University College

**Air Force ROTC**

1500 Aerospace Studies

**Army ROTC**

1600 Military Science

**Interdisciplinary Programs**

1800 Divorce Mediation

1820 Home-Based Intervention Therapy

1870 Honors Program

1880 Medical Studies

1890 Environmental Health

**Community and Technical College**

2000 Cooperative Education

2020 Associate Studies English

2030 Associate Studies Mathematics

2040 Associate Studies Social Sciences

2100 Individualized Study

2200 Educational Technology

2210 American Sign Language Interpreting and Transliterating Technology

2220 Criminal Justice Technology

2230 Fire Protection Technology

2240 Commercial Art

2250 Public Service Technology

2260 Community Services Technology

2270 Labor Studies

2280 Hospitality management

2290 Legal Assisting Technology

2420 Business Management Technology

2430 Real Estate

2440 Computer Programming Technology

2520 Marketing and Sales Technology

2540 Office Administration

2560 Transportation

2730 Histotechnology

2740 Medical Assisting

2750 Radiologic Technology

2770 Surgical Assisting

2780 Allied Health

2790 Respiratory Care

2820 General Technology

2840 Chemical Technology

2860 Electronic Engineering Technology

2870 Automated Manufacturing Engineering Technology

2880 Manufacturing Engineering Technology

2900 Instrumentation Technology

2920 Mechanical Engineering Technology

2940 Drafting and Computer Drafting Technology

2980 Surveying and Construction Engineering Technology

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**Buchtel College of Arts and Sciences**

3000 Cooperative Education

3001 Women's Studies

3002 African-American Studies

3003 Peace Studies

3005 Canadian Studies

3006 Institute for Lifespan Development and Gerontology

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3130 Cytoytechnology

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3220 Latin

3250 Economics

3300 English

3350 Geography and Planning

3370 Geology

3400 History

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**College of Engineering**

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3480 General Mathematical Sciences

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3550 Italian

3570 Russian

3580 Spanish

3600 Philosophy

3650 Physics

3700 Political Science

3750 Psychology

3850 Sociology

3870 Anthropology

3980 Public Administration and Urban Studies**

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**College of Education**

4100 General Engineering

4200 Chemical Engineering

4300 Civil Engineering

4400 Electrical Engineering

4450 Engineering Computer Science

4600 Mechanical Engineering

4800 Biomedical Engineering

4980 Construction Technology

5570 Health Education

5600 Educational Guidance and Counseling

5610 Special Education

5620 School Psychology

5630 Multicultural Education

5700 Educational Foundations and Leadership

5800 Special Educational Programs

5850 Educational Technology

5900 Higher Education Administration**

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**College of Business Administration**

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6140 Finance for Non-Business Students

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6200 Accountancy

6400 Finance

6500 Management

6600 Marketing

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**College of Fine and Applied Arts**

7000 Cooperative Education

7100 Art

7400 Home Economics and Family Ecology

7500 Music

7510 Musical Organizations

7520 Applied Music

7600 Communication

7700 Communicative Disorders

7750 Social Work

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**College of Nursing**

8000 Cooperative Education

8200 Nursing

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**School of Law**

9200 Law

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**College of Polymer Science and Polymer Engineering**

9841 Polymer Engineering

9871 Polymer Science

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* A more detailed explanation of the numbering system can be found in “Course Numbering Systems,” Section 3 in the Bulletin.
Interdisciplinary Programs

DIVORCE MEDIATION

1800:

601 DIVORCE MEDIATION 3 credits
Prerequisite: Admission to the Graduate Certificate Program in Divorce Mediation. Overview of the divorce mediation process includes guidelines for negotiating separation and divorce agreements, division of personal and real property, spousal, 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 training 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 to a maximum of nine credits toward graduation)
Prerequisite: 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.

WOMEN'S STUDIES

3001:

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. Emphasis 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:

690 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.

695 SPECIAL TOPICS 1-3 credits
Prerequisite: permission of instructor. Specialized topics and current issues in life-span development and gerontology, gender. Emphasis is on original source materials, critical analyses and synthesis of empirical, theoretical and applied aspects.

696 RETIREMENT SPECIALIST 2 credits
An investigation of issues related to the design and implementation of retirement planning and examination of financial and other aspects in 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 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 advisor. Topics include seminars, interpretation and discussion of timely environmental problems and issues covered. Instruction under direction of University faculty.

661 GRADUATE SEMINAR IN ENVIRONMENTAL STUDIES 3 credits
Prerequisite: graduate standing. Explores topics of current environmental concern. Emphasis on presentation of oral and written reports and subsequent student-faculty dialogue.

Courses of Instruction 67
Buchtel College of Arts and Sciences

BIOLOGY 3100:

509 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: Previous knowledge of plant or ecology. Ecology of coral reefs, tide pools, mangroves, internal 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* 2 credits
Prerequisite: 217. Field laboratory study of lake ecosystems. Species composition of selected biotic communities, community energetics, current cycling. Limnological survey of a local lake. Laboratory.

525 FRESHWATER ECOLOGY FIELD AND LABORATORY STUDIES 3 credits
Prerequisite: 217 of permission of instructor. Field and laboratory studies of local lakes, ponds, and reservoirs. Collection of benthos, and ecology of aquatic plants and animals, especially phytoplankton, zooplankton and benthic organisms.

526 APPLIED AQUATIC ECOLOGY* 4 credits
Prerequisite: 217 or permission. Methods and techniques 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 295. Biological basis of behavior: ethological theory, function, causation, evolution and adaptiveness of behavior. May be taken without 426/526.

529 BIOLOGY OF BEHAVIOR LABORATORY 2 credits
Prerequisites or corequisites: 426/526 and permission of instructor. Individualized, directed study to provide the student with firsthand experience in observing, describing and interpreting animal behavior.

531 GENERAL MICROMICRO PHYSIOLOGY 2 credits
Prerequisite: 511 or permission. Physiology of microscopic eucaryotes, archaeobacteria, and eubacteria.

532 ADVANCED GENERAL BACTERIOLOGY 4 credits
Prerequisite: 331. Study of the major groups of bacteria involved in the production of food or chemicals, those found in soil and water and those involved in microbial biochemical cycles. Laboratory.

533 PATHOGENIC BACTERIOLOGY 4 credits
Prerequisites: 331 and prerequisite or corequisite 437. Study of major groups of bacteria which produce infections in humans. Biochemical properties of microorganisms which engender virulence and mode 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 or 361 recommended: 433 Nature of antigens, antibody response and antigen-antibody reactions. Site and mechanism of antibody formation, hypersensitivity, immunological tolerance and immune deficiencies 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 any 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 PHYSIOLOGY 4 credits
Prerequisite: 432. 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, clubmosses, 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, including food plants. Includes wood and fiber, dyes, drugs, resins, latex and other extractives.

551 INVERTEBRATE ECOLOGY 3 credits
Prerequisite: 217 or permission of instructor. Population, their classification, functional morphology, adaptive radiation and life history. A phylogenetic approach is used. Laboratories parallel lectures.

552 PARASITOLOGY 4 credits
Prerequisites: 112, 352, 201. Principles of parasitism; host parasite interactions; important human and veterinary parasitic diseases, and control measures. Laboratories parallel lectures.

553 ORNITHOLOGY* 4 credits
Prerequisite: 112. Introduction to birds of biology; classification, anatomy, physiology, behavior, ecology, evolution, natural history and field identification. Laboratory.

554 VERTEBRATE ZOOLOGY 4 credits
Prerequisites: 316 or permission. Biology of vertebrates, except birds - evolution, ecology, behavior, systematics and anatomy. Laboratories with field trips.

561 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.

562 GENERAL AND COMPARATIVE PHYSIOLOGY 4 credits
Prerequisites: 112 and one year of organic chemistry. Study of cellular, molecular, respiratory, cardiovascular, endocrine and neural mechanisms involved in understanding physiology of various invertebrate and vertebrate animals. Laboratory.

563 ADVANCED CARDIOVASCULAR PHYSIOLOGY 3 credits
Prerequisites: 112, 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.

564 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.

565 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.

566 THE PHYSIOLOGY OF REPRODUCTION 3 credits
Prerequisites: 426/526 or permission. Study of the physiological mechanisms of reproduction throughout the animal kingdom with special emphasis upon mammalian endocrinological control of reproduction in vertebrates. The emphasis will be on a study of the mammalian system and current research presentations.

567 RESPIRATORY PHYSIOLOGY 3 credits
Prerequisites: 426/526 or 464/454 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.

568 RADIATION BIOLOGY* 2 credits
Prerequisite: permission. Principles of radiobiology, interaction with matter, pathogenesis of cellular and tissue damage, radiation safety and dosimetry, use of radionuclide compounds in laboratory. Laboratory.

569 ADVANCED GENETICS 3 credits
Prerequisite: 521. Nature of the gene; genetic codes, hereditary determinants, mutagenesis and genes in prokaryotes. Lecture and seminar.

570 PHARMACOLOGY 3 credits
Prerequisite: 511 recommended: college-level physiology. Interactions of drugs and living systems with emphasis on molecular and cellular mechanism of action, drug metabolism and excretion, and selected aspects of environmental toxicology. Clinical aspects and specific drug therapies not considered in detail.

574 WORKSHOP IN BIOLOGY 1-3 credits
May be repeated. Prerequisite: permission of instructor. Group study 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.

578 BIOLOGICAL PROBLEMS 1-2 credits each
Prerequisite: permission. Honors-level work, usually consisting of laboratory investigations.

625 PROCRYPTIC DNA TECHNIQUES 4 credits
Prerequisite: permission. Basic DNA techniques involving procaryotic microorganisms including extraction of DNA, cleavage of DNA, and rejoining. Laboratory.

631 EXPERIMENTAL BACTERIAL PHYSIOLOGY 4 credits
Prerequisite: 531 or permission of instructor. Basic techniques peculiar to study of microbial physiology and modification of selected biochemical techniques for application to microbial systems. Laboratory.

642 EUKARYOTIC GENE EXPRESSION 3 credits
A lecture course describing the basic principles, methods, and applications of molecular biology to a wide range of scientific disciplines.

648 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 300/501, or consent of instructor. Selected principles of human-physiology, pharmacology, and physiology are examined in depth, integrated, 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 EUCARYOTIC TECHNIQUES-DNA 3 credits
A graduate level laboratory course which familiarizes the student with several methods used to isolate and characterize eucaryotic DNAs at the DNA level.

684 EUCARYOTIC 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.

691 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 virology, cancer chemotherapy and animal cell genetics. Laboratory.

698 RESEARCH IN THE BIOLOGY OF AGING 3 credits each
Sequential. Prerequisite: graduate standing in biology, or by approval in related fields. Introductory research techniques in study of biological aspects of aging and experience in special research project in the field.

699 PRINCIPLES OF TRANSMISSION ELECTRON MICROSCOPY 3 credits
Prerequisites: 111, 311 or 661 or equivalent. Modern cycling or methods using transmission electron microscopy. Portfolio required to demonstrate proficiency in fixation techniques, use of ultramicrotome, light and electron microscopes and darkroom techniques.

*Field trips involved, minor transportation costs.
689 PRINCIPLES OF SCANNING ELECTRON MICROSCOPY 3 credits
Prerequisites: 311, 681 or equivalent. An introduction to 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.

697A BIOLOGY SEMINAR 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 will present their thesis research.

999 MASTER'S THESIS 1-6 credits (May be repeated) A minimum of six credits is required for thesis option students.

BIOLGY/NEUROCEN
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 microanatomy. 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 macroanatomy.

631 HUMAN GROSS ANATOMY II 3 credits
Prerequisites: Graduate standing and permission. An intensive survey of human macroanatomy.

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.

653 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.

665 SPECIAL TOPICS: BIOLOGY/NEURO/CEN 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 relationships. Enzymes as catalysts; kinetics and regulation. Collectors.

502 BIOCHEMISTRY LECTURE II 3 credits
Prerequisite: 401/501. Overview of metabolism: Thermodynamics; carbonates, fatty acid, amino acid, and nucleoside anabolism and catabolism; mornorial control of metabolism. Photosynthesis.

505 BIOCHEMISTRY LABORATORY 2 credits
Prerequisites: 401/501. Methods for isolation and analysis of amino acids, proteins, carbohydrates, lipids, and nucleic acids in their metabolism; Chromatography, electrophoresis, centrifugation, spectrophotometry and use of radioisotopes.

508 THE PROFESSIONAL CHEMIST IN INDUSTRY 2 credits
Prerequisite: Senior year or degree in chemical or chemical engineering or permission. Business, legal, societal, economic and other nonchemical aspects of a chemist's profession.

511 PHYSICAL CHEMISTRY FOR BIOLOGY MAJORS 3 credits
Prerequisites: 213 and 216 or permission. Thermoanalysis, thermodynamics, electrochemistry, chemical kinetics, macromolecules and cataoids; special topics in biochemistry, biophysics and molecular chemistry.

521 QUALITATIVE ORGANIC ANALYSIS 4 credits
Prerequisite: 266. Identification and characterization of organic substances, separation and identification of components of organic mixtures. Laboratory.

527 ADVANCED INORGANIC CHEMISTRY 3 credits

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.

691.2 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 polymers, nucleic acid.

645 CHEMISTRY OF POLYMERS LABORATORY I & II 2 credits each Sequential. Prerequisites: 264, 276. Preparation, identification of polymers to illustrate polymerization methods in 264, 645, 646.

610 BASIC QUANTUM CHEMISTRY 3 credits
Prerequisites: 314 or permission of instructor. Quantum mechanics with applications to molecular systems. Includes quantum mechanics, molecular hamiltonians, variational and perturbation methods and molecular orbitals.

611 SPECTROSCOPY 3 credits
Prerequisite: 314 or permission of instructor. Interaction of light with matter, linear and nonlinear spectroscopies. Rotational, vibrational and electronic spectroscopy. Radiotransitions and photochemistry.

612 TRANSITION-METAL ORGANOMETALLIC CHEMISTRY 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: 472 or equivalent. The organometallic chemistry of main group elements. Topics 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, electronic spectra, molecular orbital theory.

630 THEORETICAL INORGANIC CHEMISTRY 2 credits
Prerequisite: 314, 472, 629, or permission. Detailed treatment of chemistry of transition elements. Advanced group theoretical applications, ligand field theory, kinetics and mechanism, electronic spectra, molecular orbital theory.

635 THERMODYNAMICS AND STATISTICAL THERMODYNAMICS 3 credits
Prerequisites: 303 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 PHYSICAL KINETICS 3 credits
Prerequisite: 655 or permission of instructor. Phenomenological kinetics, experimental methods of investigation and analysis of reaction systems. Theoretical treatments of reaction mechanisms.

639 DESCRPTIVE INORGANIC CHEMISTRY 2 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 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.

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 solution.

685.6 EXPERIMENTAL PHYSICAL CHEMISTRY OF POLYMERS I & II 2 credits for 685.6, 2-3 credits for 685.6.

699 MASTER'S THESIS 16 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. Electroanalytical, laser spectroscopy, atomic absorption spectrometry, mass spectrometry, liquid liquid, liquid-solid and gas chromatography, ion exchange, theranamtical methods, separations, standard 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, representation elements, 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) Prerequisite: permission. Study of topics 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. Consideration of topics in biochemistry such as isozymes and diseases, genetic engineering, membrane structure and functions and recent developments in field.

720 ADVANCED BIOCHEMICAL TECHNIQUES 3 credits
Prerequisite: 402/502. An advanced lecture course on physical techniques in biochemistry. Includes optical and hydrodynamic methods; radioelectrical techniques, scattering and magnetic resonance spectroscopy.

722 ENZYMATIC REACTIONS 3 credits
Prerequisite: 401/502, 410/502 or permission. Mechanisms of enzyme catalyzed reactions, general aspects and specific examples for phosphoryl, glycol, glycerol transfers, eliminations, additions, reduction, oxidation, protonation and rearrangements. Chemistry of cofactors.

724 BIOMORGANIC CHEMISTRY 3 credits
Prerequisites: 401/501, 402/502, and 472/452. Survey of the structure and properties of metal ions complexes with amino acids, nucleic acids, metalloenzymes and macromolecules, metal in metabolism; metals in medicine.

726 ADVANCED METALLOPROTEINS 3 credits
Prerequisites: 401/501 and 402/502. Study of advanced pathways in carboxyamide, lipid and protein metalloproteins with emphasis placed on metabolic dysfunction.

899 DOCTORAL DISSERTATION 16 credits
Open only to qualified students accepted as candidates for Doctor of Philosophy in Chemistry. Supervised original research undertaken in organic, inorganic, physical, analytical or biochemistry.
ENGLISH

3300:

500 ANGLO SAXON Prerequisite: Completion of 1100/111 and 1100/112 or their equivalents, or permission of the instructor. Study in Old English language and Old English prose and poetry, including Beowulf.

503 DEVELOPMENT OF THE ARTHURIAN LEGEND 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.

506 CHAUCER Professor: 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 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 opulent and sacred poets who wrote in the metaphysical mode. Particular emphasis is placed on Herbert, Crashaw, Vaughan, Tenhammer, Marvell, Conyloc, Cleveland, Southwell and King.

521 SHAKESPEARE Professor: 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 major strategies of each writer 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 Professor: 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.

526 STUDIES IN ROMANTICISM 3 credits Prerequisite: Completion of 1100/111 and 1100/112 or their equivalents, or permission of the instructor. Study of Goethe's Iphigenie on Tauris and its equivalents, or permission of the instructor. Reading of at least five major novels of Victoriana, or varying length, by Emily Bronte, Dickens, Eliot, Thackeray and Hardy. Characterization, theme and attitude toward life emphasized.

534 CHARLES DICKENS Professor: 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 Professor: Prerequisite: Completion of 1100/111 and 1100/112 or their equivalents, or permission of the instructor. Poetry,-politics, the 19th Century, including fiction, with attention to Tennyson, Browning, Arnold, Carlyle, Ruskin and other major writers.

539 VICTORIAN POETRY AND Prose Professor: 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 FICTION Professor: 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 Professor: Prerequisite: Completion of 1100/111 and 1100/112 or their equivalents, or permission of the instructor. Study of major British poets of the 17th, 18th and 19th Centuries. Focus on key poets and their equivalents, or permission of the instructor. Study of important English novels since 1830, including Wells, Bennett and Mann.

537 BRITISH FICTION Since 1925 Professor: 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 Professor: 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-War II. Focal figures are Beckett, Goldsmith, John Osborne, Osborne and Avedon Pinter.

543 MELVILLE Professor: Prerequisite: Completion of 1100/111 and 1100/112 or their equivalents, or permission of the instructor. A study of Herman Melville, including such authors as Henry Adams, Sherwood Anderson, Mark Twain, Jerome K. Jerome, and others.

544 AMERICAN BIOGRAPHY Professor: 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, Jerome K. Jerome, Langston Hughes, William Carlos Williams, Loren Eiseley and Maya Angelou.

548 AMERICAN ROMANTIC FICTION Professor: Prerequisite: Completion of 1100/111 and 1100/112 or their equivalents, or permission of the instructor. Study of individual American short and long fiction from World War I to the present.

550 MODERN AMERICAN FICTION Professor: 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.
642 SEMINAR IN DICKINSON
An in-depth study of Dickinson's poetry, with special attention to her varied poetic identities and their relationship to life, and an examination of some of the major critical approaches to her poetry. 3 credits

643 SEMINAR IN JAMES
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. 3 credits

665 DEVELOPMENT PLANNING CRITICISM
3 credits
Inquiry into nature and value of literature and problems of practical criticism as represented in major statements of ancient and modern criticism.

674 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 the groundwork preparation for linguistic studies of literature.

675 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, theme, 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 MLA
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.

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 books 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 satire, attacks on morality and irony and literary criticism.

686 SEMINAR IN ENGLISH
(may be repeated with change of topic) 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
Original work in the field of literature and language and completion of graduate student's required thesis.

GEODEY AND PLANNING
3350:

506 GEOGRAPHIC INFORMATION SYSTEMS
3 credits
Prerequisites: 340 or permission. Tax cartography and functional geographical problems on the 300 level or above, but not including regional courses on environment. Requirements and techniques for use of all types of Geographic Information Systems (GIS). For students wishing to become applied geographers, physical and social scientist, resource managers, planners, environmental analysts.

522 TRANSPORTATION SYSTEMS PLANNING
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.

532 INTRODUCTION TO PLANNING
3 credits
Prerequisite: 330 or permission. Role of geographic investigation in city, regional and resource planning.

534 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 from field work and analysis.

538 WORLD METROPOLITAN AREAS
3 credits
Prerequisite: 330 or permission. Comparative analysis of metropolitan regions. Urbanism, environment, land use, housing, transportation, population and role of cities in economic development in different cultures.

539 DEVELOPMENT OF AMERICAN PLANNING
3 credits
Prerequisites: 330 or permission. The growth of urban and regional planning theory and practice and the development of a planning profession, particularly in the twentieth century.

542 TYPOLOGICAL CARTOGRAPHY
3 credits
Prerequisite: 341 or permission. Principles and techniques used in typological mapping. Emphasis on the use of maps to describe characteristics of classes of information both qualitative and quantitative.

544 MAP COMPOSITION AND REPRODUCTION
3 credits
Prerequisite: 341 or permission. Production of new maps or improved maps from existing maps, aerial photographs, surveys, written and other sources. Includes special cartographic considerations for production, typography and printing.

547 INTRODUCTION TO REMOTE SENSING
3 credits
Prerequisite: 341 or permission. Study of aerial photography and nonphotographic imagery developed by radar, thermal, multispectral and satellite scanners. Emphasis on use in geophysical, geological, biological and engineering research.

548 AUTOMATED COMPUTER MAPPING
3 credits
Prerequisites: 340 or permission. Study of computer-assisted map compilation and execution. Emphasis on integration of computer and cartographic skills and techniques. Problems adapted to specialized interests of student.

549 ADVANCED REMOTE SENSING
3 credits

550 SPECIAL TOPICS IN GEOGRAPHY
3 credits
A study of planning concepts and techniques for developing countries, including growth and development, planning agencies, regional inequalities and alternative approaches.

571 MEDICAL GEOGRAPHY AND HEALTH PLANNING
3 credits
Spatial analysis of diseases, their socioeconomic context; diffusion pattern of infectious diseases with particular reference to North America; health-planning processes and spatial analysis of health-care delivery facilities. Topics within the field of professional writing.

582 SPATIAL ANALYSIS
3 credits
Prerequisite: 4851585 or permission. Analysis of mapped statistical surfaces. Principles for use of map as model for statistical evidence, predictor, hypothesis testing.

592 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
1-3 credits
Prerequiste: 501 or permission. Properties, origins and uses of major soil and water and water region, landscapes. Stresses relationships between soil and the hydrological cycle, urbanization, sub-surface and agriculture. Field trips required.

596 FIELD RESEARCH METHODS
3 credits
Prerequisite: 4851585 or permission. Field work enabling student to become competent in collecting, organizing and analysis of data while carrying out field research projects.

600, 612 SEMINAR
3 credits each
May be repeated for a maximum of six credits each. Prerequisite: permission. Special topics for individual and particular fields of geography. Specialization indicated by section and title.

630 INTRODUCTION TO PLANNING THEORY
3 credits
Introduction to the political, institutional and ethical foundations and procedural theories of urban and regional planning.

634 FACILITIES PLANNING
3 credits
Study of need, process and limitation of urban facility planning.

652 LAND USE CONTROL
3 credits
Prerequisite: permission. Academic study of present and past 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.

653 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.

657 METHODS OF PLANNING ANALYSIS I
3 credits
Prerequisite: 630. Introduction to the primary analytic techniques for small-area demographic, economic and social analysis and projection.

666 METHODS OF PLANNING ANALYSIS II
3 credits
Prerequisite: 630. Review of the primary techniques for comprehensive plan preparation, evaluation and implementation.

668 ADVANCED SPATIAL ANALYSIS
3 credits
Prerequisite: 4851585 or permission. Advanced concepts and methodologies in geographic research. Emphasis on quantitative revolution in geographical analysis including multivariate procedures as factors, discriminant and economical analysis, and multidimensional scaling.

669 PLANNING INTERNSHIP
3 credits
Prerequisite: permission. Individual experience in selected planning agencies for supervised performance in professional planning.

679 HISTORY OF GEOGRAPHICAL THOUGHT
3 credits
Prerequisite: 4851585 or permission. Critical review of major developments in geographical concepts from ancient times to present.

686 INDIVIDUAL READING AND RESEARCH
1-3 credits
May be repeated twice. Prerequisite: permission of department head. Supervised original research.

699 MASTER'S THESIS
2 credits
May be repeated twice. Prerequisite: permission of department head. Supervised original research.

GEOLOGY
3370:

504 ASTROGEOLOGY
3 credits
Prerequisites: 3402.222, 3650.202 or permission. Relations of planet earth to the solar system and universe. Analysis and implications of data from lunar and space probes.

510 REGIONAL GEOLOGY OF NORTH AMERICA
3 credits
Prerequiste: 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 OCEANOLOGICAL GEOLOGY
3 credits
Prerequisites: 101, 202 or permission of instructor. Study of the origins and evolution of ocean basins and coastal deposits with particular attention paid to the interaction of waves and currents with sediment, and the development of associated sedimentary features.
Courses of Instruction

525 ADVANCED STRATIGRAPHY
Prerequisites or corequisites: 380, 324 or permission. Emphasis on correlation, depositional systems, sedimentation and facies, seismic stratigraphy, and tectonic analysis. Laboratory in the field. 3 credits

532 OPTICAL MINERALOGY-INTRODUCTORY PETROGRAPHY
Prerequisites: 231 or 231 or equivalent. Optical techniques for identification, characterization, and classification of minerals and rocks using the petrographic microscope. Laboratory. 3 credits

533 ADVANCED PETROGRAPHY
Prerequisite: 527. Petrogenesis of igneous, metamorphic and sedimentary rocks as determined by microscopic study of thin sections with emphasis on rock textures and mineral assemblages using thin section. Laboratory. 3 credits

535 PETROLEUM GEOLOGY
Prerequisite: 350 or permission. Recommended: 324. Natural occurrences of petroleum. Characteristics, origin, entrapment and exploration methods. Laboratory. 3 credits

536 GEOAL GEOLGY
Prerequisites: 101, 102, recommended: 324. Origin, composition and occurrence of coal with emphasis on depositional environments, coalification processes, exploration, evaluation and exploitation. Laboratory. 3 credits

531 ECONOMIC GEOLOGY
Prerequisites: 231 and 350. Study of metallic and nonmetallic mineral deposits emphasizing exploration and exploitation. Laboratory. 3 credits

541 FUNDAMENTALS OF GEOPHYSICS
Prerequisites: 3460:223 or permission and 3560:276. Fundamental concepts in solid earth geophysics, planetary physics, geology, and geophysics. Contributions of geophysics to recent major developments in geoscience. 3 credits

546 EXPLORATION GEOPHYSICS
Prerequisites: 3460:223, 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. 3 credits

556 ADVANCED STRUCTURAL GEOLOGY
Prerequisite: 350 or permission. Fundamental and advanced concepts of structural geology with emphasis on current and developing concepts. Laboratory. 3 credits

563 MICROPALEONTOLOGY
Prerequisite: 350 or permission. Introduction to techniques of micropaleontology evolution and paleoecology of selected microfossil groups. Laboratory. 3 credits

570 GEOSCIENCE
Prerequisites: 101, 230, 275, 312, 122, or permission. Application of chemical principles to the study of geologic processes. Laboratory. 3 credits

374 GROUNDWATER HYDROLOGY
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. 3 credits

575 REMOTE SENSING IN PETROLOGY
Prerequisite: 370 or permission. Problems of urbanization related to existing resources and creation of wastes. Geologic hazards. Case histories. Application of geodetic data to urban development. 3 credits

580 SEMINAR IN GEOLOGY
May be repeated for a total of six credits. Selected topics with reference material from original sources. 2 credits

586 SELECTED TOPICS IN GEOLOGY
1-3 credits
Prerequisite: Permission. Topics not offered as formal courses, generally of classic current importance. Entails lectures, readings, discussions and/or guided laboratory work. 1-3 credits

595 ADVANCED FIELD STUDIES
May be repeated for a total of four credits. Provided: permission. Field trip to conventional and less conventional geology areas studied in Ohio: includes trips to geological field studies, observations and data gathering, post-trip examination and/or written report. Student will bear trip expenses. 1-3 credits

606 GEOLOGY COLLOQUIUM
1 credit
Lecture on current topics in geoscience and thesis proposals and defenses by graduate students. May be repeated. Does not satisfy degree requirements. 1 credit

608 GRADUATE RESEARCH PROBLEMS
1-3 credits
May be repeated for a total of six credits. Prerequisite: Permission. Directed research and research in an aspect of geology chosen by student in consultation with an instructor. 1-3 credits

610 MASTER'S THESIS
Independent and original investigation. Must be successfully completed, reported written and defended before a committee. 6 credits

649 BOREHOLE GEOPHYSICS
Prerequisite: 449566 or permission of instructor. Elastic principles and techniques of geophysical well logging with emphasis on electrical, radioactive and sonic measurements and their quantitative evaluation. Applications in oil, gas and groundwater exploration. Laboratory. 3 credits

656 GLOBAL TECTONICS
Prerequisites: 352, 411411 or permission. Theoretical study of motion and deformation of earth's crust with emphasis on plate tectonics and associated tectonic features. 3 credits

674 ADVANCED GROUNDWATER HYDROLOGY
Prerequisites: 474/574, 577. Study of groundwater exploration and decision making. Student produces a thesis including final examination and public discussion. 3 credits

675 PHYSICAL METHODS OF PROSPECTING
2 credits
Prerequisite: permission of instructor. The use of methods of mineralogy and geology, particularly remote sensing and irrigating systems. Applications to exploration. 2 credits

684 QUANTITATIVE GEOMORPHOLOGY
Prerequisite: 432/532. Classification, regimen and utilization of groundwater. Laboratory. 3 credits

698 GEORADIOACTIVITY
Prerequisites: 432/532, or permission. Application of chemical principles to geology and geophysics including tests of hypotheses, trend surface analysis, analysis of variance, nonparametric statistics and time series analysis. 3 credits

699 RESEARCH PROBLEMS
3 credits
May be repeated for a total of nine credits. Entails lectures, readings, discussions and/or guided laboratory work. 3 credits

700 WOMEN IN REVOLUTIONARY CHINA
Prerequisites: 3460:320, 330, 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 (1949-1968) periods. 3 credits

702 SPECIAL STUDIES IN HISTORY
1-3 credits
Includes supervised independent study, as well as those subjects that are not offered as formal courses, generally of classic current importance. Entails lectures, readings, discussions and/or guided laboratory work. 1-3 credits

703 UNITED STATES SOCIAL-CULTURAL HISTORY TO 1777
3 credits
Survey of the United States; social and political ramifications of the American Revolution; Diplomacy to Independence. 3 credits

704 UNITED STATES SOCIAL-CULTURAL HISTORY SINCE 1777
3 credits
Survey of the United States; social and political ramifications of the American Revolution; Diplomacy to Independence. 3 credits

705 MICROPALEONTOLOGY
2 credits
Prerequisite: 370 or permission. Problems of urbanization related to existing resources and creation of wastes. Geologic hazards. Case histories. Application of geodetic data to urban development. 2 credits

706 EXPERIMENTAL METHODS
3 credits
Practices in research and writing. Required for history major; and for graduate major who has not taken equivalent course elsewhere but does not count for graduate credit requirements. 3 credits

707 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. 3 credits

708 UNITED STATES DIPLOMACY TO 1919
3 credits
Establishment of foreign policy; diplomacy of expansion and emergence of a world power. 3 credits

709 UNITED STATES DIPLOMACY SINCE 1914
3 credits
Responses of government to challenges of war, peace making and power politics. 3 credits

710 HISTORICAL AGENCY ADMINISTRATION
3 credits
Introduction and administration of nonacademic historical agencies: e.g., societies, museums, libraries, etc. Some field experience in a local historical agency. 3 credits

711 FUNCTIONS OF HISTORICAL AGENCIES
3 credits
Prerequisite: 431559 or permission. The functions and programs of historical agencies. Student will develop a project that involves participation in an agency function. 3 credits

712 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. 3 credits

713 LATIN AMERICA
3 credits
Prerequisites: 370, 410556 or equivalent course in statistics. Application of statistical methods to geography and geophysics including tests of hypotheses, trend surface analysis, analysis of variance, nonparametric statistics and time series analysis. 3 credits

714 TERRITORIAL HEAT FLOW
Prerequisites: 79 and 3460:235 or permission. Techniques of measuring territorial heat flows: solutions of heat conduction equation, effects of heat flow measurements, geophysical deductions and future of geothermal energy. 3 credits

715 BOREHOLE GEOPHYSICS
Prerequisite: 449566 or permission of instructor. Elastic principles and techniques of geophysical well logging with emphasis on electrical, radioactive and sonic measurements and their quantitative evaluation. Applications in oil, gas and groundwater exploration. Laboratory. 3 credits
519 CENTRAL AMERICA AND THE CARIBBEAN 3 credits
Selected aspects of the histories of Central American and Caribbean countries with emphasis on peasant and peasant movements, political reform, social, economic and political developments, and relations with the United States.

521 THE AMERICAN COLONIES IN THE 17TH CENTURY, 1601-1713 3 credits
Establishment of European colonies in America with special emphasis on English settlements and evolution of the first British Empire to 1713.

522 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-urbanization, religious revivals, economic growth and political controversies.

524 AGE OF JEFFERSON AND JACKSON, 1800-1850 3 credits
The evolution of the republic in its formative stages from Jefferson through Jackson to the establishment of European colonies in America with special emphasis on problems of modernization, the revolution, and development of communists.

528 THE ORIGINS OF MODERN AMERICA, 1777-1877 3 credits
United States from Reconstruction Era to World War I (1877-1920); emphasis on political responsibilities in the age of industrialization, society, and popular movements.

529 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, nuclear age, cold war, foreign policy and domestic affairs to present; social, political, constitutional, diplomatic, cultural and economic changes since 1945.

531 HISTORY OF AMERICAN TRANSPORTATION 3 credits
A survey of development of major transportation forms, water, road, rail, and air. Special emphasis on technological change, social and economic trends, and government support and control.

532 AMERICAN ECONOMY TO 1860 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.

533 AMERICAN ECONOMY TO 1890 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.

534 AMERICAN ENVIRONMENTAL HISTORY 3 credits
Utilitarian, conservation of natural resources from beginnings of American society to present; combination of economic, technological history of extensive treatment of public policy, environmental issues.

535 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.

536 THE AMERICAN CITY 3 credits
Development of urbanization and its consequences from colonial period to present.

537 AMERICAN FAMILY HISTORY 3 credits
Evolution of American family, colonial times to present, including developments in structure and roles and family members, and status of the aged. Exploration of methods for historical study of the family.

538 BRONZE AGE AND ARCHAIC GREECE 3 credits
An intensive survey of the history of Greece from the Neolithic period to the Persian Wars. Attention will be given to the nature of the source materials, ancient historical, textual criticism, and the like.

539 CLASSICAL AND HELLENISTIC GREECE 3 credits
Prerequisite: 436/638. An intensive survey of the history of Greece from 480 B.C. to the Hellenistic Age. Attention will be given to the nature of the source material, ancient historiography, textual criticism and the like.

540 ROMAN REPUBLIC 3 credits
An intensive survey of the Roman Republic. Attention will be given to the nature of the source material, ancient historiography, textual criticism and the like.

541 ROMAN EMPIRE 3 credits
Prerequisite: 443/545. An intensive survey of the Roman Empire. Attention will be given to the nature of the source material, ancient historiography, textual criticism and the like.

542 MEDIEVAL EUROPE 4 credits
Migration of peoples, Carolingian revival, renewed invasions, social, economic and intellectual stirrings leading to "Birth of Europe."

543 MEDIEVAL EUROPE, 1000-1500 3 credits
Middle Ages and the middle class; economic and political change, international wars, social unrest and religious crosscurrents.

544 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.

545 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.

546 THE REFORMATION 3 credits
Europe in 16th Century; its religious, cultural, political and diplomatic development, with special emphasis on Protestant, Anglican and Catholic developments.

547 EUROPEAN ABSOLUTISM AND THE ENLIGHTENMENT, 1648-1789 3 credits
Constitutional, diplomatic, cultural, intellectual and social developments of 17th Century Europe.

548 EUROPE IN THE FRENCH REVOLUTIONARY ERA, 1789-1815 3 credits
Development of Revolution; Napoleon's regime and satellites.

549 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.

551 19TH CENTURY EUROPE, 1815-1871 3 credits
Europe in the century of change, revolution, romanticism, industrialization, democratization, and nationalism. Special emphasis on the United States.

552 19TH CENTURY EUROPE, 1871-1914 3 credits
Socialism, imperialism, nationalism and the great war. The belle epoque and contemporary anticapitalist and intellectual currents.

554 20TH CENTURY EUROPE, 1914-1939 3 credits
Europe between world wars; Russian revolution, fascism and national socialism, plight of democracies.
MATHMATICS

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: 337. 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, fields extensions (Galois theory).

512 ABSTRACT ALGEBRA II 3 credits
Prerequisite: 307. Group 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, 224. or 222, 224. or 222, 224. Euclidean algorithm, unique factorization theorem, congruences, primitive roots, indices, quadratic residues, Ramanujan functions, Gaussian integers and continued fractions.

514 VECTOR ANALYSIS 3 credits
Prerequisite: 223. Vector algebra, calculus of scalar-valued, vector-valued, 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.

521,522 ADVANCED CALCULUS I AND II 3 credits each
Prerequisite: 222. 307 is highly recommended. Real number system, sequences, series, set theory, continuity, differentiation, integration, partial derivatives, multiple integration, manifolds, and theorems of the mean 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 3460.20. Mathematical analysis of numerical methods for solving equations, interpolation, function representation, approximating derivatives and integrals, approximating functions.

528 NUMERICAL LINEAR ALGEBRA 3 credits
Prerequisites: 222, 223, and 3460.20. or knowledge of FORTRAN. Mathematical analysis of numerical methods for solving linear systems, eigenvalue problems, nonlinear systems, linear least square problems.

529 NUMERICAL SOLUTIONS FOR ORDINARY DIFFERENTIAL EQUATIONS 3 credits

530 NUMERICAL SOLUTIONS FOR PARTIAL DIFFERENTIAL EQUATIONS 3 credits
Prerequisites: 223, 3460.20. or equivalent. Advanced undergraduate and graduate students. The study of finite difference and finite element methods for partial differential equations - convection, stability, convergence, and computer implementation.

531 SPECIAL FUNCTIONS AND OPERATIONAL CALCULUS 3 credits
Prerequisites: 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.

533 SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS 4 credits
Prerequisites: 235 or 335 and either 2 or 42 or 42 or permission. Analysis, solution of systems of equations, linear, nonlinear; Topics: stability, convergence and computer implementation.

534 SYSTEMS OF ORDINARY 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 4 credits
Prerequisites: 235 or 335 and either 2 or 42 or 42 or permission. Analysis, solution of systems of equations, linear, nonlinear; Topics: stability, convergence and computer implementation.

586 WRITING SEMINAR: CHINA 4 credits
Preparation of research papers, including a bibliographic essay surveying scholarship on the cultural, historical and political aspects of China.

589 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.

600 HISTORY TEACHING PRACTICUM 3 credits
Prerequisite: graduate assistantship. Required of all graduate assistants each fall-semester. Setting 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 DISSERTATION RESEARCH 3 credits
Research for Master of Arts degree thesis.

697.98 INDIVIDUAL READING FOR M.A. STUDENT 14 credits each
May be repeated, but no more than 12 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.

793.97.98 INDIVIDUAL READING FOR PH.D. STUDENT 6 credits each
May be repeated, but no more than 12 credits may apply toward the Ph.D. in history. Direct-ed reading to fit individual student programs. Written permission of the instructors required.

998 DISSERTATION RESEARCH 12 credits
Research for Doctor of Philosophy degree dissertation.

109 PH.D. DISSERTATION 12 credits
Prerequisite: 998. Writing of Doctor of Philosophy degree dissertation.
INTRODUCTION TO DISCRETE STRUCTURES
3 credits
Prerequisite: 210 or equivalent. Study of the theory of directed and undirected graphs, trees, relations, and formal languages. Topics include algorithms and applications to discrete structures.

THEORY OF TRANSFORMS
3 credits
Prerequisite: 525 or equivalent. Theory of special functions, such as Bessel and Legendre functions, and their applications to physical problems.

STRUCTURED PROGRAMMING
3 credits
Prerequisites: 316 and 416. Techniques of block programming, structured programming language, program readability, program verification and program design.

OPERATING SYSTEMS
3 credits
Prerequisites: 315 and 330 or knowledge of C. Introduction to various types of operating systems, batch processing systems, multiprogramming systems and interfacing processes; storage management, process and resource control, deadlock problem. Course is independent of particular operating system.

UNIX SYSTEM PROGRAMMING
3 credits
Prerequisite: 425 or knowledge of C. An overview of the UNIX operating system: Shell programming, process management, processor management, storage management, scheduling algorithms, resource allocation, and system programming.

THEORY OF PROGRAMMING LANGUAGES
3 credits
Prerequisites: 316 and 320. More advanced concepts underlying programming languages and their applications, formal definitions of programming languages. Backus Normal Form, semantics, compiler design.

ANALYSIS OF ALGORITHMS
3 credits
Prerequisites: 316 and 416. Design and analysis of efficient algorithms for random access machines; derivation of pattern classification algorithms.

COMPII'ER DESIGN
3 credits
Prerequisites: 307 and 396. Techniques used in designing and modifying compilers including translation, loading, execution, symbol tables and storage allocation; compiler structure, data format, language-specific features. Organization of a compiler for handling lexical scan, syntax scan, object code generation, error diagnoses, and code optimization. Use of computer programming languages. Course requires a project involving compiler writing.

DATA COMMUNICATIONS AND COMPUTER NETWORKS
3 credits
Prerequisites: 210 or knowledge of C. SDLC, TCP/IP, SNA, data switching and multiplexing, protocols, digital and analog transmission, switching and signaling, and packet-switching networks.

TOPICS IN COMPUTER GRAPHICS
3 credits
Prerequisite: 210 or knowledge of C. Topics in computer graphics. Mathematical foundations, geometric modeling, shading, texture mapping, radiosity, ray tracing, collision detection, and animation.

COMPUTER GRAPHICS
3 credits
Prerequisite: 210 or knowledge of C. Topics in computer graphics. Mathematical foundations, geometric modeling, shading, texture mapping, radiosity, ray tracing, collision detection, and animation.

ARTIFICIAL INTELLIGENCE AND HEURISTIC PROGRAMMING
3 credits
Prerequisites: 316 and 420. Study of heuristic search techniques and their applications in artificial intelligence. Topics include search techniques, planning, constraint satisfaction, and machine learning.

COMPUTER ORGANIZATION
3 credits
Prerequisite: 307. A study of computer organizations and the hardware techniques that implement them.

MICROPROCESSOR PROGRAMMING AND INTERFACING
3 credits
Prerequisites: 306 and 316. Detailed study of a particular microprocessor architecture and instruction set. Standard device interface components. Real time programming concepts.

AUTOMATA, COMPUTABILITY AND FORMAL LANGUAGES
3 credits
Prerequisite: 416. Presentation of theory of formal languages and their relation to automata. Topics include description of languages, regular context-free and context-sensitive grammar, finite state automata, pushdown and finite-bounded automata, Turing machines, closure properties, computational complexity, stack automata and decidability.

DATA-BASE MANAGEMENT
3 credits
Prerequisites: 316 and 330 or knowledge of C. Fundamentals of database organization, data manipulations and representation, data integrity, privacy.

WORKSHOP IN COMPUTER SCIENCE
1-3 credits
Prerequisites: 210 or equivalent. Topics in computer science may be selected from the following: software design, software engineering, artificial intelligence, computer graphics, computer networks, computer systems, data structures, data structures and algorithms, data structures and algorithms, data structures and algorithms, data structures and algorithms, data structures and algorithms, data structures and algorithms.

INDIVIDUAL READING IN COMPUTER SCIENCE
1-3 credits
Prerequisite: 426 or 526. Individual reading in computer science may be selected from the following: software design, software engineering, artificial intelligence, computer graphics, computer networks, computer systems, data structures, data structures and algorithms, data structures and algorithms.
561 APPLIED STATISTICS I
Prerequisite: 3450:222 or 216 or equivalent. Applications of statistical theory to natural and physical sciences and engineering, including probability distributions, interval estimation, hypothesis testing (parametric and nonparametric), and simple linear regression and correlation. 4 credits

562 APPLIED STATISTICS II
Prerequisite: 46151 or equivalent. Applications of the techniques of regression and multivariate analysis. 4 credits

565 DESIGN OF SAMPLE SURVEYS
Prerequisite: 46151 or equivalent. Design and analysis of frequently used sample survey techniques. 3 credits

569 RELIABILITY MODELS
Prerequisite: 46151. Selected topics in reliability modeling including parametric and nonparametric models, component models of failure, censored data and accelerated life models. 3 credits

571 ACTUARIAL SCIENCE I
Prerequisite: 3450:216 or 222 or equivalent. Study of various statistical, financial, and mathematical calculations used to determine insurance premiums related to contingent risks based on individual insurance framework. 3 credits

572 ACTUARIAL SCIENCE II
Prerequisite: 474151 or equivalent. Continuation of Actuarial Science I. Study of multiple life functions, multiple decrement tables, and insurance. 3 credits

575 FOUNDATIONS OF STATISTICAL QUALITY CONTROL
Prerequisite: 46151 or equivalent. Course provides a sound foundation in the theory and application of statistical techniques widely used in industry. 3 credits

580 STATISTICAL COMPUTER APPLICATIONS
Prerequisite: 46150 or an equivalent course in statistics or permission. Translation of statistical operations into computer languages, iterative procedures, generating data, Monte Carlo techniques, use of statistical packages. 3 credits

589 TOPICS IN STATISTICS
Prerequisite: 651. (May be offered for a total of six credits.) Prerequisite: permission. Selected topics in advanced statistics, including quality control, sampling techniques, decision theory, advanced inference, stochastic processes, and others. 1-3 credits

591 WORKSHOP IN STATISTICS
Prerequisite: 46151 or equivalent. (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. 1-3 credits

595 STATISTICAL CONSULTING
Prerequisite: 46150 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. 1-2 credits

620 APPLICATIONS OF MATRICES TO STATISTICS
Prerequisite: 46151 or equivalent. Matrices, introduction to multivariate normal distribution, applications of multivariate techniques to linear models, Bayesian statistics. 3 credits

650 ADVANCED PROBABILITY AND STOCHASTIC PROCESSES
Prerequisite: 651. Random walk, distributions, markovian process, limiting sequence of trials, laws of large numbers, central limit theorem, renewal theory, Markov chains, time-dependent stochastic processes. 3 credits

651 PROBABILITY AND STATISTICS
Prerequisite: 46151 or equivalent. Probability, random variables, moments and generating functions, random vectors, special distributions, limit theorems, sampling, point estimation, hypothesis testing, confidence estimation. 3 credits

652 ADVANCED MATHEMATICAL STATISTICS
Prerequisite: 650 or 632 or equivalent. Advanced study of advanced statistics, including advanced inference, stochastic processes, and applications of multivariate techniques to linear models, Bayesian statistics. 3 credits

655 LINEAR MODELS
Prerequisite: 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. 3 credits

663 EXPERIMENTAL DESIGN
Prerequisite: 662 or equivalent. Selected topics in experimental design including random and fixed effects, nested designs, split plots, confounding, fractional factorials, Latin squares, and analysis of covariance. 3 credits

664 STATISTICS FOR THE HEALTH SCIENCES
Prerequisite: 662 or equivalent. (May be used to meet major requirements for mathematical sciences majors.) Prerequisite: college-level algebra or equivalent. Descriptive statistics, probability and probability distributions, tests of hypotheses and confidence intervals, nonparametric statistics, regression, and correlation. 4 credits

665 REGRESSION AND CORRELATIONS
Prerequisites: 360 or 664 or equivalent. Analysis theory, least squares - matrix notation, methodology, multiple regression, orthogonal polynomials, correlation, partial correlation, stepwise regression, model building, response surfaces. 3 credits

666 NONPARAMETRIC STATISTICS-METHODS
Prerequisites: 560 or 651 or equivalent. Theory and practice using techniques requiring less restrictive assumptions. Nonparametric analogues to t- and F-tests, rank correlation, chi square, and related computation. 3 credits

667 FACTOR ANALYSIS
Prerequisites: 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. 3 credits

668 MULTIVARIATE STATISTICAL METHODS
Prerequisite: 560 or equivalent. Multivariate techniques including distance concept, Hotelling T2, multiple regression, ANOVA, regression and correlation, linear contrasts, factor analysis, nested and repeated measure designs, Bonferroni T tests, line discrimination analysis, canonical correlations, application. 3 credits

670 RESPONSE SURFACE METHODOLOGY
Prerequisite: 462 or 662 or equivalent. First and second order response designs, efficient experimental designs, fractional factorials. Methods for the analysis, and optimization of response functions. 3 credits

689 ADVANCED TOPICS IN STATISTICS
(Imay 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, real analysis, Bayesian statistics, and regression. 1-3 credits

692 STATISTICS AND MATHEMATICS SEMINARS
Prerequisites: For properly qualified candidate for master's degree in Statistics and Mathematics. May be repeated for a total of four credits. Seminar-type discussions involving special problems dealing with statistics and mathematics. Includes supervised research project. 2 credits

595 PRACTICUM IN STATISTICS AND MATHEMATICS
Prerequisite: graduate teaching assistant or permission. Training and experience in college teaching of statistics and mathematics. May not be used to meet degree requirements. May be taken only on a credit/non-credit basis. 1-3 credits

697 INDIVIDUAL READING
Prerequisite: Permission. May be repeated for a total of four credits. May be used for graduate standing and permission. Directed studies in statistics under guidance of selected faculty member. 1-3 credits

699 MASTERS THESIS
Prerequisite: Permission. May be repeated for a total of 4 credits. Prerequisites: Permission. Properly qualified candidates for master's degree may obtain 2-4 credits for research experience which culminates in presentation of a thesis. 2 credits

ENGINEERING

APPLIED MATHEMATICS

3490:

701.2 INTERDISCIPLINARY RESEARCH SEMINAR
Prerequisite: Graduate standing in graduate students in applied mathematics. An introduction to applied mathematics research in the mathematical sciences, physical sciences, and engineering. 1 credit

706 ADVANCED SEMINAR IN APPLIED MATHEMATICS
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. 1-3 credits

MODERN LANGUAGES

3500:

590 WORKSHOP
May be repeated. Group studies of special topics in modern languages. 2 credits

FRENCH

3520:

567 ADVANCED FRENCH GRAMMAR
Prerequisite: 360 or equivalent. Advanced study of normative French grammar with emphasis on syntax, morphology, grammatical structure and phonetic principles. 3 credits

567 FRENCH LITERATURE OF THE MIDDLE AGES AND THE RENAISSANCE
Prerequisite: 360 or equivalent. Reading and discussion of selected Medieval and Renaissance literary works. Conducted in French. 4 credits

567 17TH CENTURY FRENCH LITERATURE
Prerequisite: 360 or equivalent. Reading and discussion of selected works in poetry, drama and novels. Conducted in French. 4 credits

567 18TH CENTURY FRENCH LITERATURE
Prerequisite: 360 or equivalent. Reading and discussion of selected authors; emphasis will be on the Philosophes. Conducted in French. 4 credits

567 19TH CENTURY FRENCH LITERATURE
Prerequisite: 360 or equivalent. Reading and discussion of selected works pertaining to romantic, realistic and naturalistic movements. Conducted in French. 4 credits

567 FRANCOPHONE CARIBBEAN LITERATURE
Prerequisite: 360 or equivalent. A study of selected literary works from Haiti, Guadeloupe, and Martinique in light of their geographic, historic, socioeconomics, and cultural determinants. 4 credits

567 SELECTED THEMES IN FRENCH LITERATURE
Prerequisite: 360 or equivalent. Reading and discussion of literary works selected according to an important theme. 4 credits

567 FRENCH LANGUAGE READING PROFICIENCY
Developed to develop proficiency in reading comprehension. Preserves students for graduate reading examination. Does not count toward French major. 4 credits

603 ROMANCE AND APPLIED LINGUISTICS
History of French language from 262 to present. Second semester deals with application of linguistic research to teaching of French. 4 credits each

607 SELECTED TOPICS IN THE MOVEMENT OF IDEAS IN FRENCH LITERATURE
Study of ideas, intellectual and ideological movements in French thought and culture. 4 credits each

612 FRENCH CULTURE EXPRESSED IN LITERATURE
Prerequisite: 360 or equivalent. Anthropological approach emphasizing social and civic institutions, education, music, arts, and values and systems and relevant characteristics. 4 credits

641 SEMINAR: FRANCOPHONE LITERATURE, CULTURE AND CIVILIZATION
Study of various aspects of culture, civilization and literature of French expression outside of France. 2 credits

642 SEMINAR: THE IMAGE OF THE WOMAN IN FRENCH LITERATURE
Study of the woman as characterized in French literature from Middle Ages to present. 2 credits

661 FRENCH TEACHING PRACTICUM
Prerequisite: Teaching assistantship or permission. Orientation and practice of particular aspects of teaching language and culture. Periodic review and evaluation. Credits may not be applied toward degree requirement. 2 credits

Courses of Instruction 77
IN 20TH CENTURY HISPANIC LITERATURE
(4 credits)

Conducted in Spanish. Study in representative present-day writers and analyses of current literature. Conducted in Spanish.

SPANISH-AMERICAN LITERATURE
(4 credits)

Conducted in Spanish. Reading, discussion and analysis of selected major writings by contemporary Latin American authors, including those of Droste-Hulshoff, E. T. A. Hoffmann, Brentano, Eckehart, Conrado and others. Conducted in Spanish.

INDIVIDUAL READING IN SPANISH
(1-4 credits each)

Content of given individual reading program taken from course results approved for graduate work in Spanish.

699 MASTER'S THESIS
(4 credits)

Designed to develop proficiency in reading comprehension.

PHILOSOPHY

3600:

511 LATER DIALOGUES OF PLATO
(3 credits)

Prerequisites: one introductory course and 211 or permission of instructor. Readings of dialogues in translation, commencing with Theaetetus. Includes Parmenides, Socrates, Statesman, Phaedrus.

518 ANALYTIC PHILOSOPHY
(3 credits)

Prerequisites: 211, 312 and 313 or permission of instructor. Study of real and abstract language movements in 20th century Western and American philosophy. Deals with such figures as Russell, Carnap, Ayer, Moore, Wittgenstein, Tylor and Austin.

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 Leibniz.

524 EXISTENTIALISM
(3 credits)

Prerequisites: one introductory course in philosophy, 314 or permission of instructor. In-depth inquiry into the thought of Sartre, Husserl, 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 ABSURDITY
(3 credits)

Prerequisites: 211, 312 and 313 or permission of instructor. Detailed study of Aristotle's metaphysics, philosophy of nature, philosophy of mind and ethics. Taught in alternate years.

544 PROBLEMS IN PHILOSOPHY
(3 credits)

Prerequisites: two courses in philosophy or permission of instructor. Thorough, critical examination of one or more of Kant's philosophical works.

562 THEORY OF KNOWLEDGE
(3 credits)

Prerequisites: three courses in philosophy. Examination of nature of knowledge: theories of perception, concept and truth, problem of induction and relation of language to knowledge.

564 PHILOSOPHY OF SCIENCE
(3 credits)

Prerequisites: 191, 192 or permission of instructor. Nature of scientific inquiry, types of explanation, laws and causality, theoretical concepts and reality. Also considers critics of hypothetico-deductive view of science, e.g., Hempel and Kuhn.

671 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.

680 SEMINAR
(3 credits)

May be repeated. Prerequisite: permission of instructor.
581 PHILOSOPHY OF LANGUAGE
Prerequisites: 101 and 170 or permission of instructor. Contemporary philosophy about nature of language and the relation to reality and human thinking. Includes discussion of views of linguists such as Chomsky. 3 credits

587 INDIAN STUDY
May be repeated for a total of six credits. Prerequisites: completion of required course of philosophy 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. 1-3 credits

615 SEMINAR: HISTORY OF PHILOSOPHY
May be repeated for a total of nine credits. Prerequisite: permission of instructor. Study in philosophy of one major philosopher. 3 credits

616 ETHICAL THEORY
Examinations 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. 3 credits

618 LOGICAL THEORY
Advanced topics in logic such as modal logics and axiomatics. Recommended for law students. 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. 3 credits

690 SEMINAR
(May be repeated for a total of nine credits) 2 credits

699 MASTER’S THESIS
(May be repeated) 2 credits

PHYSICS

3650:

560 HISTORY OF PHYSICS
Prerequisite: 262 or 292. Study of origin and evolution of major principles and concepts characterizing contemporary physics. 3 credits

566 WAVES
Prerequisite: 262 or 292. Analysis of phenomena common to all waves, including free oscillations, real and imaginary waves, reflection, refraction, interference, diffraction, and wave guides and cavities. Water, sound, electromagnetic, seismic and Halebagy waves examined. 3 credits

581 MECHANICS I
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. 3 credits

582 MECHANICS II
Prerequisite: 431/513. Advanced mechanics at the senior or beginning graduate level, moving coordinate systems, mechanics of continuous media, Lagrange’s equations, tensor algebra and three-dimensional analysis, rotations or rigid bodies, vibration theory. 3 credits

583 ELECTROMAGNETISM I
Prerequisites: 292, 3450/235 or permission of instructor. Electromagnetism and mechanics at intermediate level. Electrodynamics and magnetostatics, electric field, scalar potential, dielectrics, Laplace’s and Poisson’s equations, current, magnetic flux, vector potential, magnetic materials, induction. 3 credits

584 ELECTROMAGNETISM II
Prerequisite: 436/536. Special relativity, four vectors, Maxwell’s equations in covariant form, propagation, reflection and refraction of electromagnetic waves, multipole radiation. 3 credits

585 QUANTUM PHYSICS I
Prerequisites: 261 and 3450/235. Laboratory course stressing measurement techniques with contemporary laboratory apparatus, experiment design, instrument calibration and reporting emphasis. Modern physics experiments and measurements of fundamental constants. 3 credits

586 QUANTUM PHYSICS II
Prerequisite: 441/541. Applications of quantum mechanics to atomic, nuclear and solid state physics. Determining and understanding periodic potential, Hydrogen and Helium atoms, inner atomic forces, quantum statistics. 3 credits

587 ADVANCED LABORATORY I AND II
Prerequisite: 323 or permission of instructor. Applications of electronic, solid-state devices, techniques, and research projects in contemporary physics. Introduction to research techniques, nuclear magnetic resonance, electron spin resonance, nuclear quadruple resonance, Correlation spectroscopy, Alpha- and Beta-ray spectroscopy. 3 credits

596 DIGITAL DATA ACQUISITION
Prerequisites: 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. 2 credits

570 INTRODUCTION TO SOLID-STATE PHYSICS
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 crystaline lattice. 3 credits

573.2 NMR SPECTROSCOPY I AND II
Prerequisites: 292 or permission of instructor. Theoretical basis and experimental techniques of NMR spectroscopy. Classical concepts and quantum-mechanical treatments of NMR, Bloch equations, spin-echo, and spin-echo relaxation times. Steady state and transient phenomena. General features of broadband and high-resolution NMR spectra. NMR instrumentation and operating principles. Theory and analysis of high-resolution NMR spectra. Quantitative applications of NMR in biology and high-resolution NMR spectrometers and determination of physical and chemical structures. 3 credits each

581 METHODS OF MATHEMATICAL PHYSICS I AND II
Prerequisites: 292, 3450/235 and junior or graduate standing in a physical science or engineering. Vectors, generalized coordinates, tensors, calculus of variations, vector spaces, linear transformations, matrix eigenvalues, Hilbert space, boundary value problems, transcendental functions, complex variables, analytic functions, Green’s functions, integral equations. 3 credits each

588 SELECTED TOPICS: PHYSICS
May be repeated. Prerequisite: permission. Consideration of selected topics, procedures, techniques, materials or apparatus of current interest in physics. 1-4 credits

590 WORKSHOP
May be repeated. Prerequisite: permission. Further investigations of various selected topics in physics, under guidance of faculty member. 1-4 credits

615 INDEPENDENT STUDY
May be repeated. Prerequisite: permission. Further investigations of various selected topics in physics, under guidance of faculty member. 1-4 credits

690 PHYSICS COLLOQUIUM
Lectures on current research topics in physics by invited speakers. May be repeated, but only one credit toward M.S. degree. 1 credit

695 COMPUTER PHYSICS: NUMERICAL SOLUTIONS TO PHYSICS PROBLEMS I
Prerequisite: permission. Review of FORTRAN and other computer languages, and numerical solutions to physics problems, including Newton’s and Schrödinger’s equations. Treatment of solution and reduction of experimental data, plotting, simulation. 3 credits

696 COMPUTER PHYSICS: NUMERICAL SOLUTIONS TO PHYSICS PROBLEMS II
Prerequisite: 695 or permission. Data reduction, Compalp, plotting, comparison of theoretical models with data, linear and nonlinear least squares curve-fitting. May accommodate scientific problems of individual interest. 3 credits

715 ELECTROMAGNETIC THEORY I
Prerequisite: 437/537 or permission of instructor. Electrodynamics and magnetostatics at advanced level for graduate students. Boundary value problems, dielectrics, electromagnetics, waves, reflection, refraction, wave guides and cavities, 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. 3 credits

716 ELECTROMAGNETIC THEORY II
Prerequisite: 615. Scattering and diffraction, plasma physics, special theory of relativity, dynamics of relativistic particles, collisions of charged particles, radiation from moving charges, bremstrahlung, multiple fields. 3 credits

725 QUANTUM MECHANICS I
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, Clauser-Gordon coefficients, perturbation theory, scattering, transition probabilities. 3 credits

726 QUANTUM MECHANICS II
Prerequisites: 625. Foundations of relativistic quantum mechanics. Klein-Gordon and Dirac equation, spin-zero and spin-half particles in electromagnetic field, second quantization, bosons and fermions, superfluidity and superconductivity. 3 credits

741 LANGMUIRIAN MECHANICS
Prerequisite: 432/532 or permission of instructor. Principle of least action and Lagrangian equations of motion, conservation laws, integration of moment of inertia, collisions and ams, Hamilton’s equations, canonical transformations. 3 credits

761 STATISTICAL MECHANICS
Prerequisite: 442/542 or permission of instructor. Fundamental principles of statistical mechanics: Gibbs, Fermi and Bose Statistics, solids, liquids, gases, phase equilibrium, chemical reactions. 3 credits

764 ADVANCED NUCLEAR PHYSICS
Prerequisite: 626. Quantum mechanics applied to nuclear. Interaction of radiation with nuclear, nuclear scattering, nuclear energy, energy levels of nuclei. 3 credits

766 SOLID-STATE PHYSICS I
Prerequisites: 437, 625 or permission of instructor. Theory of physics of crystalline solids. Properties of reciprocal lattice and Bragg’s law. Lattice dynamics and specific heat. Electron states; cellular method, tight-binding method, Green’s function method. 3 credits

767 SOLID-STATE PHYSICS II
Prerequisite: 686. Orthogonalization plane and pseudo potentials. Electrod-t-electron interaction, screening by impurities, Fermi sum rule and plasma oscillations. Dynamics of electrons, transport properties and Fermi surfa. 3 credits

769 SPECIAL PROBLEMS IN THEORETICAL PHYSICS
May be repeated. Prerequisite: permission. Interrelated to facilitate expansion of particular areas of interest in theoretical physics, by consultation with faculty member and independent study beyond available course work. 1-3 credits

691 SEMINAR IN THEORETICAL PHYSICS
May be repeated. Prerequisite: permission. 1-3 credits

695 GRADUATE RESEARCH
Prerequisite: permission. Candidates for M.S. degree must obtain at least five credits for satisfactory completion of research project. Grades and credit received at completion of such project. 1-6 credits

697 SPECIAL TOPICS: PHYSICS
Prerequisite: permission. Enables students who needs information in special areas, in which no formal course is offered, to acquire knowledge in these areas. 1 credit

699 MASTER’S THESIS
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. 1 credit

POLITICAL SCIENCE

3700:

502 POLITICS AND THE MEDIA
Examination of relationship between the press, the news media and political decision-making. 3 credits

503 POLITICS IN THE MIDDLE EAST
The role of the state 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. 3 credits

510 INTERNATIONAL DEFENSE POLICY
Prerequisite: At least one of the following: 220, 310, 3430, 3420, 390, 428, 468, or permission. Introduction to political uses of military forces. Major focus on methodology, conceptual, ethical dilemmas confronted in developing and implementing defense policy. 3 credits

511 THEORIES OF INTERNATIONAL POLITICAL ECONOMY
Prerequisites: 310 or permission of instructor. This course examines the predominant and emerging theories of international political economy, including imperialism, world-systems analysis, long-run theory, neorealism, and neo-realism. 3 credits

513 GLOBAL ENVIRONMENT
Prerequisites: 300, 310 or permission of instructor. Examines the global environmental challenges, including the roles played by technology and the structure of the world system. 3 credits

515 COMPARATIVE FOREIGN POLICY
Prerequisites: 310 or 220 or permission of instructor. Study of foreign policies of selected nations, with special attention to processes and institutions of decision-making of the major powers. 3 credits
672 COUNSELING PRACTICUM
Prerequisites: 620, 671; graduate standing in psychology and permission of instructor. Extension applied work and internship techniques, with supervised training in counseling clients in the psychology department Counseling Clinic.
4 credits

673 COUNSELING PRACTICUM II
Prerequisites: 630, 671, 672; graduate standing in psychology and instructor's permission. Supervised experience in psychological counseling in the psychology department Counseling Clinic. Training covers counseling, assessment and case management skills.
4 credits

674 PERSONNEL PRACTICUM
(May be repeated.) Prerequisites: 630; 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.
4 credits

689 MASTER'S THESIS (May be repeated.) Prerequisite: departmental permission. Research analysis of data and preparation of thesis for master's degree.
1-4 credits

700 SURVEY OF PROSPECTIVE TECHNIQUES
Prerequisite: 630 or instructor's permission. Introduction to rationale, assumptions and ethics, and research of prospective testing. Elementary administration, scoring and interpretation of Rorschach; and survey of other important contemporary projective instruments.
4 credits

701 PSYCHOASSESSMENT
Prerequisite: 620. Application of psychological testing to problems of diagnosis and evaluation. Practical experience in administration, scoring and interpretation. Integration of projective and objective test variables with other assessment indicators in various settings.
4 credits

707 CURRENT ISSUES IN COUNSELING
Prerequisite: 630. Advanced study of the background, theoretical foundations, research, and applications of counseling psychology as a science and profession.
4 credits

712 SUPERVISION IN COUNSELING PSYCHOLOGY I
Prerequisite: Doctoral standing or permission of instructor. Instruction and supervision in supervising a graduate student in counseling.
3 credits

713 THEORIES OF COUNSELING AND PSYCHO THERAPY
Prerequisite: 630. Graduate standing in psychology, major systems of individual psychology-encapsulated within a philosophy of science framework: humanistic, behavioral, Rogerian, cognitive, and others. Includes research, contemporary problems and ethics.
4 credits

719 VOCATIONAL BEHAVIOR
Prerequisite: 620 or departmental permission. Theories and research on vocational behavior and vocational counselors. Includes major theories of vocational behavior. Empirical research on these theories, applied work in vocational counseling and applied research.
4 credits

713 PRINCIPLES AND PRACTICE OF INDIVIDUAL INTELLIGENCE TESTING
Prerequisite: 620 or graduate standing in school psychology, and instructor's permission. History, principles and methods of intelligence testing, supervised practice in administration, scoring and interpretation of individual intelligence tests for children and adults.
4 credits

713 ADVANCED SEMINAR IN COUNSELING PSYCHOLOGY
Prerequisite: Doctoral standing or permission. Study of major issues in the field such as the counselor as a professional and as a person, issues and trends in counseling.
4 credits

713 OBJECTIVE PERSONALITY EVALUATION
Prerequisite: Completion of 4005/500, 4205/620 and 750 or 5600 645, or permission of instructor. Study of the development, administration, and interpretation of objective personality instruments for personnel selection (MMPI, CPI, BFI, 16PF and selected additional inventories) in various settings.
4 credits

713 RESEARCH DESIGN IN COUNSELING I
Prerequisite: Doctoral standing or permission. Study of research designs, evaluation procedures, and review of current research.
4 credits

713 CHILD PSYCHOLOGY
Prerequisite: 620 or permission. Current research in child psychology covered with some emphasis on cognitive development. Topics include language, memory, intelligence, hypnosis, and selected aspects of social development.
4 credits

713 PSYCHOLOGY OF ADOLESCENT AND AGING
Prerequisite: 620 or permission. Aspects of development, aging with emphasis on social and developmental aspects of psychology. Methodology and research design, including age-related changes in intelligence, personality, sensation, perception, learning, memory, and socialization and intervention approaches.
4 credits

713 SOCIAL DEVELOPMENTAL PSYCHOLOGY
Prerequisite: 620 or permission. Examination of selected theoretical and methodological issues in the study of social psychology from developmental perspective. Topics include attitude formation, sex roles, moral development, altruism, aggression, attribution, attraction processes, nonverbal behavior, and cultural effects.
4 credits

713 THEORIES OF LEARNING
Prerequisite: 620 or departmental permission. Controversy of research and theory in language and memory. Process-oriented approach adopted with emphasis on development of theoretical issues.
4 credits

713 APPLIED COGNITIVE AGING PSYCHOLOGY AND INFORMATION PROCESSING
Prerequisite: 620, 672. Graduate standing in psychology, or instructor permission. Emphasis on learning, motivation, attention, and problem solving in adulthood and their effects on areas such as environmental design, mobility, independence, neuropsychological assessment, and skilled performance.
4 credits

713 APPLIED COGNITIVE AGING PSYCHOLOGY: HIGHER PROCESSES
Prerequisites: 620, 672. Graduate standing in psychology, or instructor permission. Memory, comprehension, decision processes, intellect, and knowledge and their relation to everyday functioning in areas such as dementia, communication, judgment, awareness, expertise, wisdom, and creativity.
4 credits

713 APPLIED COGNITIVE AGING: RESEARCH
Prerequisite: Extensive reading in selected areas; design and conduct of a complete research study. May be repeated.
4 credits

713 THE PSYCHOLOGY OF MENTAL RETARDATION
Prerequisite: Graduate or graduate standing in psychology or permission of instructor. Current knowledge about the retardation process and individual differences is expected. The first half of the course is a broad survey emphasizing methodological and findings about the retardation process. The second half will involve an in-depth exploration of selected applied and basic research topics such as reaction to failure, overtraining, sexuality, training, behavioral problems, knowledge, and thinking.
4 credits

737 THE PSYCHOLOGY OF LEARNING DISABILITIES
Prerequisites: 620 or graduate standing in psychology or permission of instructor. Examination of strategies and research on learning disabilities. Emphasis is on a critical evaluation of the research which investigates hypothetical process differences between learning-disabled and normal-achieving children.
4 credits

739 APPLIED DEVELOPMENTAL PSYCHOLOGY
Prerequisites: 620 and graduate standing in psychology or permission of instructor. Examinations of methodologies, evaluation, child abuse, early intervention, day care, kibbutzim, social networks, subcultural variation, and hospitalizing.
4 credits

740 INDUSTRIAL GERONTOLOGY
Prerequisites: 610 and graduate standing in psychology or departmental permission for other students who have completed 610. Study of aged workers in work involving adult and older 40 workers. Topics include personnel selection, training, motivating and appraising older employees, health and safety, job design, vocational guidance, and retirement.
4 credits

741 SURVEY OF COUNSELING METHODS
Prerequisites: 610, 620 and graduate standing in psychology or permission of permission for other students who have completed 610. An experiential survey of treatment methods from a variety of theoretical approaches. Approaches are listed but are not limited to cognitive, psychodynamic, and humanistic.
4 credits

754 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 measurement instruments used in psychology. Study of psychometric theory and principles.
4 credits

756 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 frameworks to the study of the relationships between organizational characteristics and human behavior in the internal processes of organizations, and the relationships between organizations and their environments.
4 credits

756 PERSONNEL SELECTION AND PERFORMANCE EVALUATION
4 credits

Prerequisites: 610 and graduate standing in psychology or permission of permission for other students who have completed 610. Review of selection and performance evaluation methods and psychology of personnel selection. Use and interpretation of Job Analysis Questionnaires. Evaluation and development of selection and performance evaluation techniques.
4 credits

756 RESEARCH METHODS IN PSYCHOLOGY
4 credits

Prerequisites: 610, 620 and graduate standing in psychology or permission of permission for other students who have completed 610. Review of industrial training techniques and methods in terms of learning theory, with consideration of techniques to evaluate these training and organizational development programs.
4 credits

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 change, measurement of attitudes and the use of survey methodology.
4 credits

756 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 relationship to motivation, group performance and the role of leadership.
4 credits

756 ENGINEERING PSYCHOLOGY AND Job DESIGN
4 credits

Prerequisites: 610 and graduate standing in psychology or permission for other students who have completed 610. Drawn from the field of engineering psychology, topics include work design, task analysis, man-machine systems analysis, working conditions and accidents.
4 credits

756 JOB EVALUATION AND EQUAL PAY
4 credits

Prerequisites: 610. Major job evaluation systems will be reviewed and critiqued. Equal pay Act, minimum qualifications for a job will be reviewed. Advantages and disadvantages of various job evaluation systems will be compared. Issues concerning federal legislation 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.
4 credits

756 ORGANIZATIONAL CHANGE AND TRANSFORMATION
4 credits

Prerequisites: 610 or permission. Survey of theories and introduction to practical methods of organizational change and transformation to increase organizational effectiveness and improve employee quality of work life.
4 credits

756 INFORMATION PROCESSING AND INDUSTRIAL/ ORGANIZATIONAL PSYCHOLOGY
4 credits

Prerequisites: 610, 620, 672. Graduate standing in psychology or permission. Coverage of current theories in cognitive psychology applied to traditional concerns of industrial/organizational psychology such as performance appraisal or motivation.
4 credits

756 GRADUATE SEMINAR IN PSYCHOLOGY
1-4 credits

May be repeated. Prerequisites: graduate standing in psychology and permission. Special topics in psychology.
4 credits

756 ADVANCED COUNSELING PRACTICE
1-4 credits

May be repeated. Prerequisites: 671; 673 and permission of instructor. This course provides graduate students in counseling with actual client contacts and supervisory experiences, and prepares them for the faculty supervisory role.
4 credits

756 ADVANCED COUNSELING PRACTICUM
Prerequisites: 671; 673 and permission of instructor. This course provides graduate students in counseling with actual client contacts and supervisory experiences.
4 credits

739 DOCTORAL DISSERTATION
1-12 credits

Prerequisite: open to a properly qualified student. Required minimum for dissertation: maximum subject to departmental approval. Supervised research on topic deemed suitable by the dissertation committee.

687 SOCIAL CHANGE
Advanced seminar in theories of social change. (Same as KSU 722321 Seminar.) 3 credits

688 HUMAN ECOLOGY
Selected problems in analysis of social behavior in relation to physical environment. Overview of theories and applications of human ecology. (Same as KSU 726561 Seminar.) 3 credits

689 URBAN ECOLOGY
Seminar in the theory and measurement of social ecology of urban areas. Emphasis on trends and changing distribution of social and organizational behavior in urban America. 3 credits

690 READINGS IN CONTEMPORARY SOCIOLOGICAL LITERATURE
Prerequisites: seven credits of sociology and permission of advisor, exploration of line of development, intensive reading and interpretation of written material in student's chosen field of interest. Regular conferences with instructor. 1-3 credits

691 DIRECTED RESEARCH
May be repeated with permission. Empirical research to be conducted by the student under graduate faculty supervision. 1-6 credits

692 THESIS
May be repeated for a total of six credits. Prerequisite: permission. Supervised thesis work. 1-6 credits

700 COLLOQUIUM IN SOCIOLOGY
Prerequisites: teaching assistants of permission. Training and experience in college teaching of sociology. Not approved as credit toward a degree. Seminar. 2 credits

705 THEORY AND MEASUREMENT OF SOCIAL ATTITUDES
Prerequisites: 603 and 604, or permission. Seminar in theory of social attitudes and techniques for their measurement. (Same as KSU 722321 Seminar.) 3 credits

706 MULTIVARIATE TECHNIQUES IN SOCIOLOGY
Prerequisites: 603 and 604, or permission; a sociology graduate student only. Methodological problems using advanced multivariate techniques in analysis of sociological data. Topics selected on basis of student's major and minor, current research, and social problem. 3 credits

708 ADVANCED TECHNIQUES IN RESEARCH
Prerequisite: 706 or permission. Theory and methods of measurement; topics in social research. Topics include estimating reliability and validity, scale and item design, alternative measurement strategies, and measurement models. Seminar. 2-5 credits

711 SURVEY RESEARCH METHODS
Prerequisites: 603 and 604, or permission. In-depth study of design and administration of social surveys. (Same as KSU 722321 Seminar.) 3 credits

712 EXPERIMENTAL AND QUASI-EXPERIMENTAL RESEARCH IN SOCIOLOGY
Prerequisites: 603, 604 or Seminar. Application of experimental and quasi-experimental methods in sociological research with special attention given to appropriate designs, statistical analysis and empirical literature. Seminar. 3 credits

714 QUALITATIVE METHODOLOGY
Prerequisite: 603 or permission. Theory and method in seeking through the application of such techniques as participant-observation, open-ended interview, content analysis, ethnography, biographical and other social studies methods. (Same as KSU 722321 Seminar.) 2 credits

716 THEORY CONSTRUCTION
Prerequisites: 603, 604, or permission. Theory building and methods of constructing scientific theory. Emphasis on writing of scientific articles, accumulating, and interpreting factors and influences. Seminar. 1-3 credits

717 SOCIAL TOPICS IN SOCIOLOGICAL THEORY
Open course to cover current area not readily subsumable under other headings. Content of course to be determined by instructor. (Same as KSU 722321 Seminar.) 1-3 credits

718 EARLY SOCIOLOGICAL THOUGHT
Prerequisite: 607 or permission. Two to four major sociological theorists prior to 1930 examined in depth. Specific persons considered will be chosen by instructor but will be announced well in advance of beginning of term. Seminar. 3 credits

719 SOCIOLOGICAL THOUGHT
MAY BE REPEATED FOR CREDIT. Prerequisite: permission. Two distinct schools of sociological thought will be selected by the instructor for in-depth reading and comparative analysis. Seminar. 2 credits

723 SMALL GROUP RESEARCH TECHNIQUES
Prerequisite 621. Application and implications of research in small groups. Focus on both laboratory and field studies. Seminar. Laboratory. 3 credits

727 CONTEMPORARY TRENDS IN SOCIAL PSYCHOLOGY
Selected topics on significant contemporary issues, theories and methodological developments in social psychology. Seminar. 1-3 credits

728 RESEARCH IN SOCIAL PSYCHOLOGY
Prerequisite: 631. Design and development of a research project oriented to empirically examining selected concepts in social psychology. (Same as KSU 722321 Seminar.) 1 credit

729 URBAN SOCIOLOGY
Analysis of theories of urban process and review of major contributions to empirical analysis of urban life. (Same as KSU 726591 Seminar.) 3 credits

730 RESEARCH IN COMMUNITY AND AREA PROBLEMS
Prerequisite: permission. Special investigation of community, area or regional problems; design and execution of small-scale, planned study, with instructor. (Same as KSU 726591 Seminar.) 3 credits

733 SPECIAL TOPICS IN SOCIAL ORGANIZATION
Open course to cover content area not readily subsumable under other headings. Content of course to be determined by instructor. (Same as KSU 726591 Seminar.) 1-3 credits

734 ISSUES IN URBAN ANALYSIS
Special topics seminar dealing with current and special topics in urban process and analysis. Seminar. 1-3 credits

756 RESEARCH IN SOCIAL ORGANIZATION
Prerequisite: 545. 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 726541 Research.) 1 credit

758 SEMINAR IN URBAN PROCESSES
Prerequisites: 603, 604, or permission. Critical examination of current research and theory related to urban life specific emphasis on social change in urban environment. Seminar. 3 credits

767 SPECIAL TOPICS IN DEVIANCE AND DISORGANIZATION
Prerequisite: 603. Introduction to the psychological problems of deviance and social organization. Seminar. 1-3 credits

774 RESEARCH IN DEVIANCE AND DISORGANIZATION
Prerequisite: 603. Research in the psychological problems of deviance and social organization. Seminar. 1-3 credits

783 CONTEMPORARY ISSUES IN SOCIAL CHANGE
Prerequisites 607, 608, or permission. Emphasis on social issues. Seminar. 3 credits

787 RESEARCH IN SOCIAL CHANGE
Prerequisite: 607. Critical analysis of current research and methodology. Seminar. 1 credit

790 RESEARCH IN HUMAN ECOLOGY
Prerequisite: 603. Improvise a research or selected aspect of human ecology by individual student with previous training in this area. Topic to be arranged by student and instructor. Research. 1 credit
ANTHROPOLOGY

3870:

505 HISTORY AND THEORY IN ANTHROPOLOGY
Prerequisite: 150 or permission. Examination of theories and problems in social and cultural anthropology. Historical development, methods and style. Contemporary theoretical perspectives. 3 credits

555 CULTURE AND PERSONALITY
Prerequisite: 150 or permission. Examination of functional and causal relationships between culture and individual and collective behavior. Lectures. 3 credits

557 CULTURE AND MEDICINE
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. 3 credits

561 LANGUAGE AND CULTURE
Prerequisite: 150 or permission. Examination of language structure and interaction of language, cognition and culture. Lecture. 3 credits

563 SOCIAL ANTHROPOLOGY
Prerequisite: 150 or permission. Comparative structural analysis of non-Western systems of kinship and social organization in terms of status, role, reciprocal expectations, numencre, nuclear and extended households and other kinship groupings. Lecture. 3 credits

572 SPECIAL TOPICS: ANTHROPOLOGY
May be repeated. Prerequisite: 150 or permission and permission. Designed to meet needs of students with interests in selected topics in anthropology. Offered irregularly when resources and opportunities permit. May include an archaeological field school, laboratory research of advanced course work, not presently offered by department on regular basis. 1-3 credits each

594 WORKSHOP IN ANTHROPOLOGY
May be repeated. Group study of special topics in anthropology. May not be used to meet departmental undergraduate or graduate major requirements. May be used for elective credit only. 1-3 credits

591 SEMINAR IN ANTHROPOLOGICAL THEORIES AND METHODS
May be repeated. Prerequisite: 3 credits. Major theoretical viewpoints in cultural anthropology. Nature, scope of research problems. Survey of methods in field work. Seminar. 3 credits

607 INDIVIDUAL INVESTIGATION
Prerequisite: 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. 1-2 credits

PUBLIC ADMINISTRATION AND URBAN STUDIES

3980:

590 WORKSHOP
May be repeated. Group study 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. 1-3 credits

600 BASIC ANALYTICAL RESEARCH
Prerequisite: permission. Examines basic framework of social science research methodologies and statistical techniques. Includes problem-solving and sampling. 3 credits

601 ADVANCED RESEARCH AND STATISTICAL METHODS
Prerequisite: 600. Extends study of social science to include more advanced research designs and multivariate statistical techniques. 3 credits

602 AMERICAN URBAN DEVELOPMENT
Examination of major literature on processes of urbanization in United States and selected facets of urban institutional development. 3 credits

610 LEGAL FOUNDATIONS OF PUBLIC ADMINISTRATION
Prerequisite: permission. Introduction to the legal foundations and context of public administration, including the interaction of the court, public organizations, public administration and the public. Foundation course for later MBA study. 3 credits

611 INTRODUCTION TO THE PROFESSION OF PUBLIC ADMINISTRATION
Prerequisite: permission. Introduction to the theory and practice of the field of public administration. Foundation course for later MPA study. 3 credits

612 NATIONAL URBAN POLICY
Prerequisite: permission. Major federal policies that relate to urban problems examined in regard to political processes, implementation and impact. 3 credits

612 INTERGOVERNMENTAL MANAGEMENT
Prerequisite: permission. Examination of intergovernmental relationships as they apply to urban administration and management. 3 credits

614 ETHICS AND PUBLIC SERVICE
Prerequisite: permission. Examination of the ethical problems and implications of decisions and policies made by those whose actions impact on the public. Case studies of decision making in the public government and in private (business and the professionals) arenas, are studied in relation to classical and modern ethical theory. 3 credits

615 PUBLIC ORGANIZATION THEORY
Prerequisite: 611 and 616 or equivalent. Examines the development of public organizational theory and the current status of theoretical developments in the field of public administration. 3 credits

616 PERSONNEL MANAGEMENT IN THE PUBLIC SECTOR
Prerequisite: permission. Fundamental issues and principles of public sector personnel administration, including recruitment, selection, training, motivation, supervision, evaluation, labor relations and affirmative action. 3 credits

617 LEADERSHIP AND DECISION MAKING
Examination of the content of public organizational management including relevant organizational theories, strategic management, and planning and public sector leadership. 3 credits

618 CITIZEN PARTICIPATION
The fundamental theory, background, techniques, and issues of citizen participation in urban planning. 3 credits

620 SOCIAL SERVICES PLANNING
Prerequisite: permission. In-depth analysis of social services requirements and various ways in which social services planning function is carried out in urban communities. 3 credits

621 URBAN SOCIETY AND SERVICE SYSTEMS
Prerequisite: permission. Analysis of social bases of urban society, hierarchy, social problems, relationships to planning, public services. 3 credits

622 URBAN PLANNING AND HEALTH CARE
Basic knowledge of the health service delivery system is provided for planners and administrators in the public sector. 3 credits

623 PUBLIC WORKS ADMINISTRATION
Prerequisite: permission. Examination of the building, maintenance, and management of public works. 3 credits

636 PARKS AND RECREATION
Prerequisite: permission. Deals with theory, practice, evaluation of recreational administration, parks planning. 3 credits

640 FISCAL ANALYSIS
Prerequisite: permission. Study of revenue and expenditure patterns of the city government. 3 credits

641 URBAN ECONOMIC GROWTH AND DEVELOPMENT
Prerequisite: permission. Examination of urban economic and its susceptibility to social, economic, political, and physical changes. 3 credits

642 PUBLIC BUDGETING
Prerequisite: permission. Current professional practice and theoretical issues in public budgeting and management of capital and operating budgets. 3 credits

643 INTRODUCTION TO PUBLIC POLICY
Prerequisite: permission. An introduction to the study of public policy formulation, identification of major policy issues, and the analysis of policy implementation and policy impact. 3 credits

645 COMPARATIVE URBAN SYSTEMS
Prerequisite: permission. Conceptual schemes and methodology for comparative urban analysis among a number of major cities selected from each continent. 3 credits

670 RESEARCH FOR FUTURES PLANNING
Prerequisite: 600 and 601. Introduction to the study of futures planning. 1-2 credits

671 RESEARCH AND EVALUATION IN URBAN STUDIES
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. 3 credits

672 ALTERNATIVE URBAN FORCES
Prerequisite: 600 and 620. An introduction to the study of alternative urban futures and their implications for planning and public policy in urban communities. 3 credits

673 COMPUTER APPLICATIONS IN PUBLIC ORGANIZATIONS
Prerequisite: 600 and 601. Introduction to computer applications in the public sector, including data entry, statistical analysis, report writing, technical representation, and spreadsheets. 3 credits

674 ANALYTICAL TECHNIQUES FOR PUBLIC ADMINISTRATION
Prerequisite: 600. Public sector applications of quantitative techniques, including decision analysis, queuing theory, mathematical programming, and simulation. 3 credits

690 SELECTED TOPICS IN URBAN STUDIES
Prerequisite: permission. Selected topics in specific areas of urban planning, various developmental processes of cities, or in various urban policy and administrative issues. (A maximum of 27 credits may be earned in 690 and 691.) 1-3 credits each

690B URBAN STUDIES SEMINAR
Prerequisite: 15 credits of urban studies core plus quantitative techniques. Urban research methods applied to specific urban research area. Comprehensive paper required. 3 credits

695 INTERNSHIP
May be repeated for a total of three credits. Prerequisite permission. Field-based work experience in which student participates in policy making, administrative operations in local, state and federal governments and urban agencies. 1-3 credits

697 INDIVIDUAL STUDIES
May be repeated for a total of four credits. Directed individual research or reading on specific area or topic. 1-3 credits

699 MASTER'S THESIS
Prerequisite: permission. Supervised thesis writing. May be repeated for a total of nine credits. 1-3 credits

700 ADVANCED RESEARCH METHODS I
Prerequisite: master's level statistics or permission. Introduction to statistical techniques and methodologies in doctoral and postdoctoral research. Emphasis on conceptual and mathematical interrelationships. 3 credits

701 ADVANCED RESEARCH METHODS II
Prerequisite: 700 or equivalent. Introduction to statistical techniques and methodologies in doctoral and postdoctoral research. (Same as 690B.) 3 credits

702 URBAN THEORY I
Prerequisite: permission. Review of major theoretical traditions examining urban problems, for students entering the doctoral program in urban studies (first year in two-course sequence). 3 credits

703 URBAN THEORY II
Prerequisite: 702. Review of major professional disciplines dealing with urban problems, for students entering the doctoral program in urban studies (second year in two-course sequence) 3 credits

704 PUBLIC BUREAUCRACY
Prerequisite: permission. Analysis of bureaucratic operations in the implementation of public policy, including special attributes of human service organizations and the democratic political system. 3 credits

705 ECONOMICS OF URBAN POLICY
Prerequisite: master's level knowledge of macroeconomics and microeconomics or special permission. Use of methods of economic analysis in a seminar format to examine concepts available to urban policy makers in operations of public services and economic development of urban areas and communities. 3 credits

706 PROGRAM EVALUATION
Prerequisite: permission. Advanced treatment of topics in program evaluation. 3 credits

707 URBAN PLANNING AND MANAGEMENT STRATEGIES
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. 3 credits

708 URBAN POLICY: THE HISTORICAL PERSPECTIVE
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. 3 credits
799 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 public administration 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.)
561 SOILS PROCESSING
Prerequisite: 421 and 530 or permission. Comprehensive problems in sedimentation, fluidization, drying and other operations involving solids in liquid and gas continua. 3 credits

562 POLLUTION CONTROL
Prerequisite: 353 or permission. Air and water pollution sources and problems. Engineering aspects and methodology: microbial and chemical processes, and fate and behavior of pollutants in the environment. 3 credits

566 DIGITAL DATA AND SIMULATION
Prerequisite: permission. Data acquisition and analysis by digital devices, digital control applications and design. 3 credits

570 ELECTROCHEMICAL ENGINEERING
Prerequisites: 322, 335. Chemical engineering principles as applied to the study of electrode processes and in 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. 3 credits

572 SEPARATION PROCESSES IN BIOCHEMICAL ENGINEERING
Prerequisite: 353. Introduction to the separation and purification techniques pertinent to biochemical processes, with emphasis on the engineering considerations for large-scale operations. 3 credits

486 CHEMICAL REACTION ENGINEERING
Prerequisite: 320 or permission. Kinetics of homogeneous and heterogeneous systems. Reactor design for ideal and non-ideal flow systems. 3 credits

610 CLASICALL THERMODYNAMICS
Prerequisite: 225. Discussion of laws of thermodynamics and their application. Precision and control of the thermodynamic data. Phase and reaction equilibria. 3 credits

630 PROCESS DYNAMICS
Prerequisite: 600. Development and solutions of mathematical models for chemical processes involving reactants based on transport phenomenon principles, population balance methods, and systems analysis. 3 credits

631 CHEMICAL ENGINEERING ANALYSIS
Prerequisites: 322, 325, 330. Mathematical analysis of problems in transport processes, chemical kinetics and control systems. Solution techniques for these problems and their practical significance are stressed. Heuristic plots will be given for necessary theory developments. 3 credits

632 NONLINEAR DYNAMICS AND CHAOS
Prerequisite: 340/325. Description and analysis of the complex behavior exhibited by nonlinear equations. Emphasis is on the numerical methods to quantify chaos. 3 credits

635 ADVANCED POLYMER ENGINEERING
Prerequisite: 322, 600, or permission. Detailed treatment of transport phenomena, chemical kinetics and control systems. Solution techniques for these problems, and their practical significance are stressed. Heuristic plots will be given for necessary theory developments. 3 credits

640 ADVANCED PLANT DESIGN
Prerequisite: permission. Advanced treatment of process and equipment design, scale-up, optimization, process synthesis, process economics. Case problems. 3 credits

680 HETEROGENEOUS CATALYSIS
Prerequisite: 410, 510. Kinetics and mechanisms of heterogeneous and homogeneous catalytic reactions. Characterization and design of heterogeneous catalysts. 3 credits

689 TOPICS IN CHEMICAL ENGINEERING
Prerequisite: 421. 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, solar, synthetic fuels processing, biorefining, simulation of continuous processes in multiphase reactors, and reactor design. 3 credits

696 MASTERS’ RESEARCH
Prerequisite: Permission of advisor. (May be repeated to a maximum of six credits.) On appropriate research. 4 credits

699 MASTERS’ THESIS
(If repeated to a maximum of six credits.) For properly qualified candidate for master’s degree. Supervised research in specified area of chemical engineering selected on basis of availability of facilities and faculty. 16 credits

701 ADVANCED TRANSPORT PHENOMENA
Prerequisite: 600. Advanced theory of transport phenomena such as mass transfer, fluid dynamics, and heat and mass transfer phenomena. 3 credits

702 MULTIPHASE TRANSPORT PHENOMENA
Prerequisite: 530. General transport theory, kinematics, Cauchy’s theorems, and the initial and boundary conditions are developed as follows. The theories of viscosity and Navier-Stokes equations are derived and applied to certain multiphase applications. 3 credits

706 ADVANCED REACTION ENGINEERING
Prerequisite: 605. Kinetics of heterogeneous systems. Steady and unsteady state, mathematical modeling of chemical reactions. Solution and additional topics drawn from current literature. 3 credits

711 ADVANCED CHEMICAL ENGINEERING THERMODYNAMICS
Prerequisite: 510. Advanced topics in thermodynamics, including phase and reaction equilibria at high pressures, phase equilibrium for multiphase systems, reaction equilibria in multiphase systems, and thermodynamics of surfaces, thermodynamics of systems under stress, nonequilibrium thermodynamics and current topics from literature. 3 credits

715 MOMENTUM TRANSPORT
Prerequisite: 600. Discussion of potential flow, boundary layer formation and turbulent flow phenomena for Newtonian fluids. 3 credits

716 NON-NEWTONIAN FLUID MECHANICS
Prerequisite: 600. Tensor and curvilinear coordinates, Newtonian viscometries. Development of non-Newtonian constitutive equations. Special and general flows of various constitutive models. 3 credits

720 ENERGY TRANSPORT
Prerequisite: 600. Conduction, natural and forced convection, and radiation heat transfer involving the equations of continuity, motion and energy. 3 credits

721 TOPICS IN ENERGY TRANSPORT
Prerequisite: 720. Advanced analytical and graphical methods for solving complex heat transfer problems found in chemical engineering. 3 credits

725 MASS TRANSFER
Prerequisite: 600. Theory of mass transfer with applications to absorption, adsorption distillation, reactive distillation, and heterogeneous catalysis. 3 credits

731 PROCESS CONTROL
Prerequisite: 630. Introduction to modern control theory of chemical processes including cascade control and rate-diffusion control. 3 credits

735 POLYMER ENGINEERING TOPICS
Prerequisite: permission. Selected topics of current interest in polymer engineering, such as modeling of reactants or processes, multiphase reactions, multiphase fluid, artificial fiber engineering. 3 credits

736 CHEMICAL PROCESSING OF ADVANCED MATERIALS
Prerequisite: 605. Advanced materials such as ceramics, optical materials, sensors, catalysts; application of reaction engineering to sewage processing, ceramic processing, modified chemical vapor deposition. 3 credits

742 ADVANCED CATALYST DESIGN
Prerequisite: 605. Development of catalyst theory and its application to the design of practical catalysts. 3 credits

759 ADVANCED POLLUTION CONTROL
Prerequisite: 635, 653, or permission. Analysis of current environmental research in analytical instrumentation, air and water pollution control, hazardous waste treatment, and nuclear waste disposal. (May be repeated for a total of six credits. Prerequisite: permission. 3 credits

899 PRELIMINARY RESEARCH
(If repeated for a total of 15 credits.) Prerequisite: approval of dissertation director. Preliminary research investigations prior to submission of dissertation proposal to the Interdisciplinary Doctoral Committee. 1-15 credits

899 DOCTORAL DISSERTATION
(If repeated 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. 1-15 credits

CIVIL ENGINEERING

4300:

514 DESIGN OF EARTH STRUCTURES
Prerequisite: 341 or permission. Design of earth structures, dams, highway fills, cofferdams, etc. Embankment construction techniques, quality control, embankment analysis, instrumentation, foundations, soil stabilization, embankment analysis and control. Design problem. Graduate students will perform more advanced analysis and design. 3 credits

518 SOIL AND ROCK EXPLORATION
Prerequisite: 341 or permission. Site exploration criteria and planning. Conventional boring, sampling, and in situ testing methods. Theory and application of geophysics and geological methods including seismic electrical resistivity, gravity, magnetic and radiometric measurements. Air photo interpretation. 3 credits

521 CHEMISTRY FOR ENVIRONMENTAL ENGINEERS
3 credits (2 lecture - 1 lab) Prerequisite: 323. One year of college chemistry. General, physical, organic, biochemistry, and color chemistry concepts applied to environmental engineering. Concepts are used in water quality monitoring and system assessment. 3 credits

526 ENVIRONMENTAL ENGINEERING DESIGN
Prerequisite: 223. An introduction to the physical, chemical and biological processes utilized in the treatment of water and wastewater, with design parameters emphasized. 3 credits

527 WATER QUALITY MODELING AND MANAGEMENT
Prerequisite: 323. Analysis and simulation of the physical, chemical and biological processes affecting stream quality. Development of management strategies based upon the application of water quality modeling techniques to environmental systems. 3 credits

528 HAZARDOUS AND SOLID WASTES
Prerequisite: senior standing or permission of instructor. Design, evaluation, and data presentation. Handling, processing, using, shipping, storage and disposal methods are discussed on a non-technical constraints outlined. 3 credits

531 APPLIED HYDRAULICS
Prerequisite: 341. Review of design principles: urban hydraulics, steam channel mechanics, sedimentation, coastal engineering. 3 credits

551 COMPUTER METHODS OF STRUCTURAL ANALYSIS
Prerequisites: Structures and Computer programs. Finite element software, interactive graphics, beam stiffness concepts and matrix formatization, simple and complex structural systems modeling, vibrational analysis. 3 credits

553 STRUCTURAL DESIGN
Prerequisite: 306. Basic concepts in structural optimization. Mathematical programming methods, including constrained optimization, minimization and constrained optimization on a digital computer. 3 credits

554 ADVANCED MECHANICS OF MATERIALS
Prerequisite: 220 or equivalent. Three-dimensional state of stress and strain analysis. Analysis of bending and torsional members. Introduction to energy methods, instability behavior of prismatic members. 3 credits

556 Transportation Planning
Prerequisite: 351. Theory and techniques for development, analysis and evaluation of transportation systems plans. Emphasis on understanding and using tools and professional methods available to solve transportation planning problems, especially in urban areas. 3 credits
564 HIGHWAY DESIGN
Prerequisite: 365. Study of modern design of geometric and pavement features of highways. Design problem and computer use. Graduate students produce a more complete design.

565 PAVEMENT ENGINEERING
Prerequisite: 564. Theory of elasticity, of viscoelasticity and of layered systems as applied to pavements. Pavement materials characterization, pavement design, pavement preservation for rigid and flexible pavements.

566 TRANSPORTATION ENGINEERING
Prerequisite: 365. Vehicle and urban travel characteristics, traffic flow theory, traffic studies, accidents and safety, traffic sign and marking, traffic signal planning, traffic control and transportation administration.

568 HIGHWAY MATERIALS
Prerequisites: 365, 360 or permission. Properties of aggregates, and composition, and properties of pavement materials. Preparation of asphalt mixtures, design and testing of asphalt pavement mixes and of surface treatments. Laboratory preparation of specimens and determination of properties. Graduate student requirement. Graduate students required to perform an additional eighth house laboratory assignment (Arizona recovery of asphalt from source) and to prepare a paper on a highway materials topic.

574 UNDERGROUND CONSTRUCTION
Prerequisite: 374. Description of practices and techniques of underground construction. Selection of proper method for individual job. Design of underground openings, support systems and excavations.

584 DYNAMICS OF STRUCTURES

590 STRUCTURAL STABILITY
Prerequisite: 554 or equivalent. Rigorous dynamic analysis of one, two, multiple and infinite degrees of freedom structural systems. Elastic-plastic, plastic analysis. Analytic systems. Dynamic systems, buckling.

591 ENERGY METHODS AND ELASTICITY
Prerequisite: 552. Work and complementary work. Stress energy and complementary strain energy. Virtual work and Castigliano's theorems. Variational methods. Applications. Formulation of boundary-value problems of elasticity. Selected topics in energy methods and elastic analysis.

595 Pressurized Concrete
Prerequisite: 404. Basic concepts. Design of double-towel roof garden; shear development. Loadings on columns; piles. Design of highway bridge girder. Transversal, post-tensioned, continuous girders; columns; volume-change forces; connections.

597 MULTISTORY BUILDING DESIGN
Prerequisite: 554. Ductility, flood systems, staggered truss systems, broad frame design, undamaged frame design, drift indoxes, monocoque (tubular and partial tubular) systems, earthquake design, fire protection. Analysis by STRUCL.

599 FINITE ELEMENT ANALYSIS
Prerequisite: 554 or equivalent. Introduction of finite element method as applied to various topics from continuum mechanics. Such approaches as plane, axisymmetric and 3-D stress analysis, conduction, fluid mechanics; transient problems of geometric and material nonlinearity.

600 INTRODUCTION TO COMPOSITE MATERIALS
Prerequisite: 554 or equivalent. Fundamentals of composite materials such as mechanics, macromechanics and laminate theory discussed from geometrical, stress-strain relationships to laminate analysis for stiffness and strength. The geometrical, mechanical, thermal and physical behavior or composites described in terms of corresponding properties of the constituents. Emphasis placed on the physics of composite behavior, design and analysis of fiber composites in laminates subjected to mechanical and environmental loading conditions.

611 FUNDAMENTALS OF SOIL BEHAVIOR
Prerequisite: 334. In-depth examination of structure and fundamental physical-chemical and mechanical properties of engineering soils viewed as porous-permeable media.

612 ADVANCED SOIL MECHANICS
Prerequisite: 334. Study of mechanical behavior of soil as continuum. Principles of stress, strain, deformation, shear strength and pore water pressure as applied to mechanical behavior of natural soils.

613 ADVANCED GEOTECHNICAL TESTING
Prerequisites: 589, 622. Theory and practice of static and dynamic in situ and laboratory soil testing. Sampling procedures, applicability, limitations. General evaluation of geotechnical parameters for routine and special site conditions. One lecture, two laboratory periods per week.

614 FOUNDATION ENGINEERING I
Prerequisites: 333 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-anchored structures including retaining walls, embankments and backfills.

615 FOUNDATION ENGINEERING II
Prerequisite: 614 or permission. Structural-interaction theory and applications to underground structures including conduits, tunnels and shafts. Advanced foundation construction methods and problems including load sharing, soil stabilization, underpinning and softening.

616 Slope Stabilization

617 NUMERICAL METHODS IN GEOTECHNICAL ENGINEERING
Prerequisites: 333 and 334. Steady-state and transient flow through soils, consolidation, soil-structure interaction, piling, stress-deformation analysis of earth structures.

618 ROCK ENGINEERING
Prerequisite: 554 or permission. Mechanical nature of rocks; joint elasticity and application to rock problems; inelastic behavior of rocks, time dependence and effects of pore pressure, exploration, design, classification of rock properties; failure theory and crack propagation.

620 SANITARY ENGINEERING PROBLEMS
Prerequisite: 322. 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 WATER AND WASTE-WATER LABORATORY
Prerequisite: 420 or permission of instructor. Conduct of laboratory experiments to familiarize student with the design and operation of water and wastewater treatment processes. Experimental design, data collection, analysis and report preparation.

622 WATER TREATMENT PLANT DESIGN
Prerequisite: 554 or permission. 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-benefit ratios.

623 WASTEWATER TREATMENT PLANT DESIGN
Prerequisite: permission. 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 design to be utilized.

624 ENGINEERING MANAGEMENT OF WATER UTILITIES
Prerequisite: permission. Concepts of principles of the water utility management systems and engineering management in perspective to various and complex problems. Fundamentals of responsibilities and duties applicable to water utilities.

625 WATER AND WASTEWATER IMPROVEMENT I
Prerequisite: 423. Theory, current research, associated with physical-chemical processes, the impact on design, construction/operation, sedimentation, filtration, absorption processes for wastewater treatment.

626 WATER AND WASTEWATER PROCESSES II
Prerequisite: 423. Theory, current research associated with biological processes, related physical-chemical processes, impact on design-activated sludge, fixed film processes, gas transfer, sludge stabilization, sludge dewatering processes in wastewater treatment plant design.

627 WATER POLLUTION PRINCIPLES
Prerequisite: 423 or permission. Principles of water chemistry, microbiology, and chemical reaction engineering as applied to understanding and solving environmental problems.

628 ADVANCED FLUID MECHANICS

629 OPEN CHANNEL HYDRAULICS
Prerequisite: 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.

630 APPLIED HYDROLOGY
Prerequisite: Discussion of water cycle such as precipitation, evaporation, stream flows, floods, infiltration. Methodology and analysis. Application to studies on demand, storage, transportation including mathematical modeling of urban runoff and statistical hydrology.

631 COASTAL ENGINEERING
Prerequisite: 523 or permission. Elementary theory of ocean mechanics and mechanical behavior of materials with relation to static, plastic and creep responses; nearshore and shore areas; earthquake effects and their implementation.

632 ELASTICITY

633 PLASTICITY

634 ADVANCED REINFORCED CONCRETE DESIGN

635 ADVANCED STEEL DESIGN
Prerequisite: 407. Properties of steel, fasteners, bearing, friction joints, Gusset plates, bolts, in tension, and plates, weld joints, cyclic loads, fatigue analysis, type of detail, torsion, stability and interaction.

636 EXPERIMENTAL METHODS IN STRUCTURAL MECHANICS

637 LIMIT ANALYSIS IN STRUCTURAL ENGINEERING
Prerequisite: 450 or equivalent. Computational theorems of limit analyses. The boundary and upper-bound solutions. Applications to frames, plates and plane stress and strain problems. Design considerations. Mathematical programming and computer implementation.

638 ADVANCED SEMINAR IN CIVIL ENGINEERING
Prerequisite: Permission. Advanced projects, reading, studies, or experiments in various areas of civil engineering.

639 ENGINEERING REPORT
Prerequisite: Permission. Preparation of project to solve a specific 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.

640 MASTERS' RESEARCH
Prerequisite: Permission of advisor. May be repeated. Research on a suitable topic in civil engineering culminating in a master's thesis.

641 MASTERS' THESIS
Prerequisite: Permission of advisor. May be repeated. Research and thesis on some suitable topic in civil engineering as approved by department. Defense of thesis is by final examination.

642 EARTHQUAKE ENGINEERING

643 PLATES AND SHELLS
Prerequisites: 632 and 495. Plates and shells. Exact field equations and upper-bound solutions. Approximation methods, including finite difference, forces in middle plate. Large deflections. Differential geometry of a surface. Shells of revolution.

644 VISCOELASTICITY AND VISCOPLASTICITY

645 FINITE ELEMENT ANALYSIS II

646 ADVANCED COMPOSITE MECHANICS
Prerequisite: 687. Analysis of composite materials and composite behavior, buckling, vibration and bending of laminated plates and shells. Advanced topics involving stress concentration, residual stress, fatigue, fracture toughness, nonlinear and viscoelastic stress-strain formulations, solutions of non-linear problems.
DYNAMIC PLASTICITY
Prerequisite: 363 or 303. Impulsive and transient loading of structural elements, solid elements, plates, shells, and inelastic deformation. Topics include transient and longitudinal transverse plastic wave propagation in thin rods, propagation of plastic hinges, rate-dependent, visco-elastic waves, transverse impact on beams and plates, heat-treatment, blast loading, plate perforation, shock waves in solids.

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, bursting and blast loads.

LIM PRELIMINARY RESEARCH
1-7 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.

DOCTORAL DISSERTATION
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.

ELECTRICAL ENGINEERING 4400:

ENGINEERING ECONOMY
3 credits
Prerequisites: 3250:244 and senior standing. Presents engineering economics as distinguished from classical economic theory.

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 and transmission.

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.

MICROWAVES
4 credits
Prerequisite: 354 or equivalent. Dynamic fields, Maxwell's equations and wave equations. Field analysis of wave guides, microwave components, techniques, and systems.

COMPUTER CIRCUITS
4 credits
Prerequisite: 353, electronic circuitry considerations in logic circuits, methods of sequential circuit synthesis, logic networks, design, use, computer arithmetic elements, memory, storage devices.

CONTROL SYSTEMS II
4 credits
Prerequisite: 371. Stability, controllability, and observability, design of control systems. Discrete systems, analysis, digital computer control. Includes hybrid, AC control system, digital computer control.

SYMBOLIC COMPONENTS
3 credits
Prerequisite: 381. Per unit method as applied to power system calculations. Fundamental principles of symbolic components as applied to analysis of electrical circuits and machines.

POWER ELECTRONICS I
3 credits
Prerequisite: 381. Elements of power electronics circuits. Rectifiers, converters, inverters, analysis and design.

POWER ELECTRONICS LABORATORY AND DESIGN PROJECT
2 credits
Prerequisite: 483(S). Projects on different types of power electronic converters: AC/DC, DC/DC, AC/AC. Design project to include design, simulation, and computer control.

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.

TOPICS IN ELECTRICAL ENGINEERING
2 credits
May be taken more than once. Prerequisite: permission of department head. Special topics in electrical engineering.

ADVANCED MICROCOMPUTER SYSTEMS
3 credits
Prerequisite: 365 or permission. Discussion of multiprocessors, numerical data processors, multitasking, system bus architectures. 16-bit and 32-bit microprocessor architectures, multi-level protection and virtual memory, as supported by commercial microprocessors.

CIRCUIT ANALYSIS
3 credits
Prerequisite: graduate standing. Operational methods, time domain analysis, state variable methods and matrix methods applied in circuit analysis. Realizability and synthesis of driving point impedance and transfer functions.

RANDOM SIGNAL ANALYSIS
3 credits
Prerequisite: 447. Analysis, interpretation and smoothing of engineering data through application of statistical and probability methods.

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.

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.

DIGITAL SIGNAL PROCESSING
3 credits
Prerequisite: 333. Introduction to general concepts and principles of discrete-time Fourier transforms, digital filtering, sampling, and aliasing. Design of digital filters.

DIGITAL SP SPECTRAL ANALYSIS AND SIGNAL MODELLING
3 credits
Prerequisite: 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 signal communications.

DETECTION AND ESTIMATION THEORY
3 credits
Prerequisite: 641 or permission. Signal detection, estimation of signal parameters in noise, Blahut, minimum, Neyman-Pearson criteria, nonparametric and robust procedures, Wiener and Kalman filtering.

STATISTICAL COMMUNICATION THEORY
3 credits
Prerequisite: 641 or permission of instructor. Fundamental principles of transmission of digital information over noisy channels. Optimum receivers. Bandwidth and dimension. Capacity of the binary channel.

ELECTROMAGNETIC THEORY I
3 credits

ELECTROMAGNETIC THEORY II
3 credits
Prerequisite: 650 or permission of the course instructor. Scattering, TEM waves, guided wave theory, radiation from lines, closed-boundary guides and cavities, model orthogonality and completeness. Green's function, excitation and coupling. Open-boundary waveguides.

ADVANCED ELECTROMAGNETICS
3 credits

ADVANCED ANTENNA THEORY AND DESIGN
3 credits
Prerequisite: 453/553 or equivalent. Basic properties and recent advances of microwave antennas. Analysis and design of reflector antennas. Analysis and synthesis of linear and planar antenna arrays.

DESIGN OF DIGITAL SYSTEMS
3 credits
Prerequisite: 452. Applications of logic circuits in modern digital electronic computer and in digital communication systems. Computer organization and control, input/output devices and peripheral standards, advanced topics in computers.

TOPICS IN ELECTRONICS
3 credits
Prerequisite: permission of department head. Discussions of recent advances in electronics.

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, fabrication, testing, and design procedures.

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 Shockley and PN diodes and field-effect and bipolar transistors.

Discrete Control Systems
3 credits
Prerequisite: 472/572 or permission. Theory, techniques for analysis, design of discrete control systems. Includes transform techniques, stability analysis, frequency response. Optimization. Digital computer control.

NONLINEAR CONTROL
3 credits
Prerequisite: 674 or instructor permission. Designed to provide students with qualitatively new insights into nonlinear systems as well as techniques for controlling such systems. Topics include describing functions, Popov and circle criteria, jumps, resonances, subharmonics, phase limits, and computer simulation.

Control System Theory
3 credits
Prerequisite: 371 or instructor permission. Advanced modern control theory for linear systems. Controllability, observability, normal realizations of multivariable systems, stability, state variable feedback, estimation, and an introduction to optimal control.

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 multipath methods, nonlinear methods, ODE solvers, system optimization, parallel simulation, and computer languages.

Random Process Analysis
3 credits
Prerequisite: 674. Analysis and design of control systems with stochastically defined input. Introduction to estimation filters.

Optimal Control I
3 credits
Prerequisite: 674. Formulation of optimization problem, application of variational calculus, maximum principle and optimality principle to control problems. Computational techniques in optimization.

DYNAMICS AND CONTROL OF POWER ELECTRONIC CIRCUITS
3 credits
Prerequisite: 482(S). Study of magnetic and semiconductor models for rectifiers, inverters, DC/DC converters. Small and large-signal models about the cyclic steady-state. Feedback controls using classical and modern approaches.

Electrical System Analysis
3 credits
Prerequisite: 480. Short circuit and load flow analysis of power systems with emphasis on computer solution. transient analysis.

Power System Stability
3 credits
Prerequisite: 651. Steady state and transient stability of power systems with emphasis on computer solution.

Economics of Power Systems
3 credits
Prerequisite: 651. Analysis and operation of power system for economic dispatching using a computer.

Protective Relaying
3 credits
Prerequisite: 683. Principles and application of relays as applied to protection of power systems.

Surge Protection
3 credits
Prerequisite: 682. Phenomena of lightning and switching surges on electrical systems. Protection of systems and apparatus by line design, application of protective devices and insulation coordination.

Dynamics of Electric Machines
3 credits
Prerequisite: 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.

Power Electronics II
3 credits
Prerequisite: 480 or equivalent. Effects of the nonlinearities of the power circuit components, magnetics, base and gate drives, thyristor commutation circuits, heat transfer and thermal issues. Analysis and design of advanced power systems.

Electric Control of Electric Machines
3 credits
Prerequisite: graduate student in Electrical Engineering. Elements of control circuits for electric drives, techniques for transistorized control of electric machines.

Power Electronic Devices
3 credits
Prerequisite: graduate status in Electrical Engineering. Structure and physics of power semiconductor devices: diodes, Bipolar junction transistors, MOSFETs, Thyristors, etc. Design of MOS-Bipolar devices (IGTMC). Emphasis on the issues that characterize these devices from the lower power semiconductor devices.
SPECIAL PROBLEMS (May be taken more than once: Prerequisite permission of department head. For qualified graduate student. Supervised research or investigation in major field of training or experience. Credits depend upon nature and extent of project.)

MASTER'S RESEARCH (May be taken more than once: Prerequisite: approval of advisor. May be repeated.) Research on a suitable topic in electrical engineering culminating in a master's thesis. Supervised research or investigation in major field of training or experience. Credits depend upon nature and extent of project.

MASTER'S THESIS (May be taken more than once: Prerequisite: permission of department head. Research and thesis on some suitable topic in electrical engineering.)

TOPIX 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.

MODEL REDUCTION TECHNIQUES FOR CONTROL SYSTEMS

3 credits
Prerequisite: 674 or permission of the instructor. Classical methods, optimal techniques for reducing complex order models of linear, nonlinear, and infinite dimensional systems. Minimal realizations of multi-variable systems are also considered.

ADVANCED LINEAR CONTROL SYSTEMS

3 credits
Prerequisite: 674 and a grade in Real Analysis or equivalent. Covered topics related to the design of robust control systems. The synthesis of controllers which yield stable closed-loop systems will be examined. The Minimum Variance criterion for controller design is included. Special emphasis will be given to the robust stabilization problem and the robust disturbance attenuation problem.

ROBUST CONTROL

3 credits
Prerequisite: 674. Introduction and state-space characterizations of robust control systems, and design techniques based on the structural Riccati equation. Deterministic and stochastic control design methodologies.

OPTIMAL CONTROL I

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.

ADAPTIVE CONTROL

3 credits
Prerequisite: 671 or permission of instructor. This course will provide the advanced graduate student with the mathematical basis 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.

ADVANCED TOPICS IN CONTROL

3 credits
Prerequisite: 776. Discussions of recent advances in control systems.

ADVANCED SEMINAR

1-3 credits
May be taken more than once: Prerequisite: permission of department head. Advanced level coverage of special topics. For student seeking Ph.D. in Engineering.

PRELIMINARY RESEARCH

1-15 credits
Prerequisite: 776. Preliminary examination. Preliminary investigations prior to submission of a dissertation proposal to the Interdisciplinary Doctoral Committee.

DOCTORAL DISSERTATION

0-15 credits
Prerequisite: 776. Acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student.

ENGINEERING COMPUTER SCIENCE

4450:

SOFTWARE ENGINEERING

3 credits
Prerequisites: 3460:209 and instructor's permission. Software life cycle, specification, design and implementation of team projects.

INTEGRATED SYSTEM DESIGN

3 credits
Prerequisites: 4170. Introduction to the systems design, design methods and development tools for VLSI systems; MOMS-devices and fabrication. Processing and control design. Layout methods and tools. Design systems.

SPECIAL TOPICS: COMPUTER SCIENCE

1-2 credits
May be taken more than once: Prerequisite: permission of department head. Special topics in computer engineering.

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 system implementation. Memory organization. System configurations.

PARALLEL COMPUTER ARCHITECTURE

3 credits
Prerequisite: 4400:363 or equivalent. This course provides an introduction to parallel computer architecture. The presentation is based on a single instruction, message-passing, and shared memory.

COMPUTER ALGORITHMS I

3 credits
Prerequisites: 4100:218 and 3425:236. Organization of scientific and engineering problems for computer solution. Analysis of error and convergence properties of algorithms.

COMPUTER ALGORITHMS II

3 credits
Prerequisite: 610 or permission. Data structures and algorithm design for minimum execution time and minimum memory requirements.

FAULT-TOLERANT COMPUTING

3 credits
Prerequisite: 363 or equivalent. The course encompasses the many aspects of fault-tolerant computing. It approaches the subject from design, implementation, and architectural design techniques, quantitative evaluation methods, testing, and design for testability.

ADVANCED KNOWLEDGE ENGINEERING

3 credits
Prerequisite: 610 or equivalent. Advanced study of knowledge acquisition and expert system project management.

FRAME-BASED EXPERT SYSTEM DESIGN

3 credits
Prerequisites: 441, 610, or equivalent. Introduction to the design and development of frame-based expert systems.

MECHANICAL ENGINEERING

4600:

THERMAL SYSTEM COMPONENTS

3 credits
Prerequisites: 301, 310, 379. Performance analysis and design of bulk components of thermal energy systems and conversion systems. Components studied include heat exchangers, pumps, compressors, turbines, and expansion engines.

HEATING AND AIR CONDITIONING

3 credits
Prerequisites: 301, 310, 379. 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.

FLUID MECHANICS

3 credits

COMPUTATIONAL 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.

INTRODUCTION TO AERODYNAMICS

3 credits
Prerequisites: 301, 300 and 391. Introduction to aerodynamics concepts, elementary transformations, aerodynamics theory of thin airfoils, 2-dimensional airflow, wings of finite span, lifting surfaces, vortex-vertices, and panel methods.

AEROSPACE PROPULSION

3 credits
Prerequisites: 300 and 390 or permission. Introduction to propulsion systems currently used in the aerospace field. Propulsion system designs for turbines for turbofan, turbojet, ramjet, chemical rocket, and electric rocket propulsion.

ENERGY CONVERSION

3 credits
Prerequisites: 280, 271, 355. Topics from fields of internal combustion engines, cycle analysis, modern conversion devices.

ENERGY TRANSFER PROCESSES

3 credits
Prerequisite: 315. Analysis, design of extended surfaces. Natural convection, combined modes of heat transfer and heat transfer with a change of phase. Heat transfer in magnetohydrodynamic systems.

EXPERIMENTAL STRESS ANALYSIS I

3 credits

STRUCTURAL DYNAMICS

3 credits
Prerequisites: 211, Static and dynamic forces in structures, products of inertia, dynamic equilibrium, kinematics, balancing of rotating, reciprocating, cyclic motion. Computer simulation of transient mechanical dynamics, other topics in advanced dynamics.

FUNDAMENTALS OF MECHANICAL VIBRATIONS

3 credits
Prerequisites: 203 and 2610:235. Undamped and forced vibrations of systems having one or two degrees of freedom.

VEHICLE DYNAMICS

3 credits

SYSTEM DYNAMICS AND CONTROL

4 credits

CONTROL SYSTEMS DESIGN

3 credits
Prerequisites: 315, 431, 340. Methods of feedback control design such as minimax error, stochastic, feedback, and state observer control techniques. Multivariable and optimal design methods and computer-aided control design.

INDUSTRIAL AUTOMATIC CONTROL

3 credits
Prerequisites: 440 or equivalent. Generation of basic control mechanisms. Study of hydraulic, pneumatic, fluidic control systems, including application areas. Tuning of control devices for optimum performance of systems. Case studies on control applications from industry. E.g., boilers, furnaces, process heaters.

OPTIMIZATION METHODS IN MECHANICAL ENGINEERING

3 credits
Prerequisite: 363. Development and method of solution of optimization problems in mechanical engineering. The use of dynamic programming and operational research methods for optimization including computer simulation and applications.

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.

INTRODUCTION TO COMPUTATIONAL FLUID FLOW AND CONVECTION

3 credits
Prerequisites: 315, 360, or permission of instructor. Numerical modeling of fluid system, numerical solution of the momentum and thermal boundary layer equations, flow simulation using advanced heat transfer and turbulence packages.

PRESSURE VESSEL DESIGN

3 credits
Prerequisites: 236, 4100:102. Introduction to modern pressure vessel technology. Topics include: basic structural considerations, materials and their environment and design-incorrect features.

COMPUTER AIDED DESIGN AND MANUFACTURING

3 credits
Prerequisites: 430 or permission. The use of computer systems to assist in the design, modification, analysis, or optimization of engineering designs, and to plan, manage, and control, manufacturing plants.
RADIATION

Convective heat transfer at high velocities.

Prerequisite: 301, 310

616. DYNAMICS OF VISCOS FLUID

Heat transfer from moving bodies. Turbulence and shear stresses. Heat transfer in newtonian and non-newtonian fluids.

Prerequisite: 301, 310 or equivalent.

617. RADIATION HEAT TRANSFER


Prerequisite: 301, 310 or equivalent.

618. BOILING HEAT TRANSFER AND TWO-PHASE FLOW

BOILING HEAT TRANSFER AND TWO-PHASE FLOW. Current techniques to determine heat transfer and pressure drop in two-phase flow systems. Case studies on boiling heat transfer in nuclear reactors and other industrial applications.

Prerequisites: 301, 310 or equivalent.

620. EXPERIMENTAL STRESS ANALYSIS II

Experimental stress analysis using strain gage, rosette, and other techniques. Stress concentration factors and stress intensity factors. Fatigue testing and failure analysis.

Prerequisite: 424/522

621. INTRODUCTION TO THE MECHANICS

Introduction to the mechanics of solids and fluids. Basic concepts of stress, strain, and energy. Application to structural and mechanical systems.

Prerequisite: Permission. Topics include stress, strain, and energy concepts.

622. CONTINUUM MECHANICS


Prerequisite: 336 or equivalent.

623. FUNDAMENTAL OF FRACTURE MECHANICS


Prerequisite: 301, 310 or equivalent.

624. ADVANCED MECHANICS OF ENGINEERING MATERIALS

Advanced mechanics of engineering materials. Stress-strain relations, plasticity, and fracture mechanics. Applications to composite materials and advanced engineering systems.

Prerequisite: 624 or permission.

625. MECHANICAL BEHAVIOR OF MATERIALS

Mechanical behavior of engineering materials. Stress-strain relations, plasticity, and fracture mechanics. Applications to composite materials and advanced engineering systems.

Prerequisite: 301, 310 or equivalent.

626. NONLINEAR ENGINEERING PROBLEMS

Nonlinear engineering problems. Introduction to nonlinear theory and methods. Applications to structural and mechanical systems.

Prerequisite: 622 or permission.

627. VIBRATIONS OF DISCRETE SYSTEMS

Vibrations of discrete systems. Analysis of simple and complex systems. Applications to mechanical and structural systems.

Prerequisite: 424/522 or equivalent.

628. KINETIC DESIGN

Kinetic design and mechanical systems. Design of mechanical systems. Applications to mechanical engineering and systems design.

Prerequisite: 421 and permission.

629. RELIABILITY IN DESIGN

Reliability in design. Introduction to computer-aided design. Applications to mechanical and structural systems.

Prerequisite: 337 or permission and 3470/4450/5450.

630. COMPUTERIZED MHD ANALYSIS OF STRUCTURES

Computerized MHD analysis of structures. Applications to magnetic and electrical systems. Analysis of magnetic fields and force interactions.

Prerequisite: 630 or equivalent.

631. ADVANCED DYNAMICS OF ROTATING MACHINERY

Advanced dynamics of rotating machinery. Analysis of rotating machinery systems. Applications to mechanical and electrical systems.

Prerequisite: 420/520 or equivalent.

632. STRESSES IN SOLIDS AND FLUIDS

Stresses in solids and fluids. Analysis of stress distributions in solids and fluids. Applications to structural and mechanical systems.

Prerequisite: 420/520 or equivalent.

633. SYSTEMS ANALYSIS AND CONTROL DESIGN

Systems analysis and control design. Analysis of linear and nonlinear systems. Applications to control systems and mechanical systems.

Prerequisite: 420/520 or equivalent.

634. DISTRIBUTED PROCESS CONTROL DESIGN AND APPLICATIONS

Distributed process control design and applications. Analysis of distributed control systems. Applications to industrial and mechanical systems.

Prerequisite: 420/520 or equivalent.

635. PROCESS IDENTIFICATION AND COMPUTER CONTROL

Process identification and computer control. Analysis of computer control systems. Applications to industrial and mechanical systems.

Prerequisite: 426 or equivalent or permission.

636. EXPERT SYSTEMS IN CONTROL AND MANUFACTURING

Expert systems in control and manufacturing. Analysis of expert systems in industrial and mechanical systems. Applications to control and production systems.

Prerequisite: 420/520 or equivalent.

637. NEURAL AND FUZZY CONTROL SYSTEMS

Neural and fuzzy control systems. Analysis of neural and fuzzy control systems. Applications to industrial and mechanical systems.

Prerequisite: 420/520 or equivalent.

638. TRIBOLOGY

Tribology. Analysis of friction and lubrication. Applications to industrial and mechanical systems. Applications to industrial and mechanical systems.

Prerequisite: 622 or permission.

639. ENGINEERING ANALYSIS

Engineering analysis. Analysis of mechanical systems. Applications to mechanical and structural systems.

Prerequisite: 622 or permission.

640. FINITE ELEMENT ANALYSIS II

Finite element analysis. Analysis of structural and mechanical systems. Applications to mechanical and structural systems.

Prerequisite: 630 or equivalent.

641. OPTIMIZATION AND CONTROL

Optimization and control. Analysis of optimization and control systems. Applications to mechanical and structural systems.

Prerequisite: 630 or equivalent or permission.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>660</td>
<td>BIOMATERIALS AND LABORATORY</td>
<td>4 credits</td>
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<tr>
<td></td>
<td>Concurrent: Biometrics Laboratory. Materials in biological applications. Effect of physiological environment and perception on materials. Considered and uncontrolled degradation effects of materials on soft tissue, hard tissue and blood. Laboratory experiments using materials designed for biointerface and demonstration of biocompatible interfaces.</td>
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<tr>
<td>683</td>
<td>ARTIFICIAL ORGANS</td>
<td>3 credits</td>
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<td></td>
<td>Prerequisite: 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 fabrication of artificial organs, with emphasis on the artificial heart and artificial kidney.</td>
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<tr>
<td>685</td>
<td>SPECIAL TOPICS</td>
<td>1-15 credits</td>
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<tr>
<td></td>
<td>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.</td>
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<tr>
<td>686</td>
<td>MASTERS RESEARCH</td>
<td>1-15 credits</td>
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<tr>
<td></td>
<td>Prerequisite: permission of advisor. May be repeated. Research on a suitable topic in biomedical engineering culminating in a master’s thesis.</td>
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<tr>
<td>689</td>
<td>MASTERS THESIS</td>
<td>1-15 credits</td>
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<td></td>
<td>Prerequisite: permission of advisor. Supervised research in the specific area of biomedical engineering. May be repeated.</td>
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<tr>
<td>690</td>
<td>PRELIMINARY RESEARCH</td>
<td>1-15 credits</td>
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<tr>
<td></td>
<td>Prerequisite: permission of advisor. Supervised research in the specific area of biomedical engineering. May be repeated.</td>
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</tr>
<tr>
<td>688</td>
<td>DOCTORAL DISSERTATION</td>
<td>1-15 credits</td>
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<td></td>
<td>Prerequisite: acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student.</td>
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</tbody>
</table>
EDUCATIONAL FOUNDATIONS
5100:

512 DESIGN AND PRODUCTION OF INSTRUCTIONAL MATERIALS 3 credits (20 clinical hours)
Covers design, adaptation and preparation of media materials. Student produces media materials including overhead projection transparencies, audio-recordings, slide sequences and open-ended materials. The student offers original project choices.

514 ORGANIZING AND SUPERVISING EDUCATIONAL MEDIA PROGRAMS 3 credits
Prerequisite: 512 or permission of the instructor. Procedures for planning, organizing and evaluating educational media programs including media facilities and services.

520 INTRODUCTION TO COMPUTER-BASED EDUCATION 3 credits
Prerequisite: graduate or senior standing. Techniques for developing, implementing and evaluating computer-based education. Participants will work with instructional materials and instructional computing languages. Both the hardware and software considerations are assessed.

590, 592 WORKSHOP 1-3 credits
Individual workshops under staff guidance on curriculum problems, utilization of community resources, planning of curricular units.

594 EDUCATIONAL INSTITUTES
Special courses designed as inservice upgrading programs.

600 PHILOSOPHIES OF EDUCATION 3 credits
Examinations 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 character-styles. 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 related to study of educational institutions, theories and ideas. Different topics will be offered from section to section.

616 ABDUCTION EDUCATION 2 credits
Survey course for teachers and administrators. Historical backgrounds including influence and their relation to developments in the field. Emphasis on background and social value of current programs.

620 BEHAVIORAL BASES OF EDUCATION 3 credits
Prerequisite: 250 or equivalent. Introduction to scientific study of learning and development. Student required to study current theories, research in areas of learning, development, motivation and instruction.

624 SEMINAR: EDUCATIONAL PSYCHOLOGY 3 credits
Prerequisite: 250 or equivalent. In-depth study of research in selected areas of learning, development, motivation and instruction.

630 TOPICAL SEMINAR IN COMPUTER-BASED EDUCATION 3 credits
Prerequisite: 250 or equivalent. Advanced topics related to development, implementation, research and evaluation in CBE. Emphasis on student oriented, flexible, knowledge of programming language recommended.

636 SEMINAR EDUCATIONAL TECHNOLOGY 3 credits
Practise and theory in educational communications and technology including charters, learning stations, programmed learning and educational television and computer-assisted instruction. Special topics in educational communications and technology.

640 TECHNIQUES OF RESEARCH 3 credits
Research methods and strategies commonly used in education and behavioral sciences; preparation of research reports. Includes library, historical, survey and experimental research and literature review.

640 TOPICAL SEMINAR IN MEASUREMENT AND EVALUATION 3 credits
Prerequisite: 250 or equivalent. Advanced topics related to measurement and evaluation in education. Emphasis will be placed on understanding the relationship between the individual and the testing situation.

640 MULTICULTURAL COUNSELING 3 credits
Prerequisite: 5900.943 or permission of instructor. An examination of multicultural counseling theory and research. Appropriate to work with culturally diverse people.

640 INDIVIDUAL AND FAMILY DEVELOPMENT ACROSS THE LIFESPAN 3 credits
An examination of individual and family developments. Emphasis will be placed on understanding the relationship between the individual and the family.

650 FIELD EXPERIENCE: MASTERS 1-3 credits
Prerequisite: permission of department head and instructor. Area determined in accordance with student's program in professional goals.

650 INDEPENDENT STUDY 1-3 credits
Prerequisite: permission of department head and instructor. Specific area of study determined in accordance with student's program and professional goals.

650 MASTERS' PROBLEM 2 credits
Prerequisite: permission of department head and instructor. Specific area of study determined in accordance with student's program and professional goals.

650 MASTERS' THESIS 4 credits
Prerequisite: permission of department head and instructor. Final project in research problem within the student's field of study.

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 the development of higher education in the western world, with special emphasis given to higher education's development in the United States.

705 SEMINAR: PHILOSOPHY FOUNDATIONS OF EDUCATION 3 credits
Prerequisite: 600 or equivalent. In-depth study of the philosophical, social, economic and psychological factors affecting the development of education in the United States and other countries.

711 LEARNING PROCESSES 3 credits
Study of principles underlying classroom learning processes with particular emphasis on teaching methods of modifying pupil behavior, cognitive, motor, social and affective.

720 TEACHER BEHAVIOR AND INSTRUCTION 3 credits
Prerequisite: 600 or equivalent. Study of the theoretical and empirical literature involving the development and acquisition of teaching behavior and the conceptualization of instruction. A student paper on topics, empirical research and applications in areas of individual interests.

741 STATISTICS IN EDUCATION 3 credits
Prerequisite: 650 or equivalent. Statistical methods and techniques used in educational measurement and in educational research. Emphasis on hypothesis testing.

743 SEMINAR: INSTRUCTIONAL STATISTICS 3 credits
Prerequisite: 741. A second course on quantification in behavioral sciences. Includes testing of statistical hypotheses, experimental design, analysis of variance and nonparametric factor analysis and introduction to nonparametric statistics.

790 RESEARCH PROJECT IN SPECIAL AREAS 1-3 credits
Prerequisites: permission of department head and instructor. Critical and indepth study of research problems 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. Emphasis on developing a dissertation proposal.

897 INDEPENDENT STUDY 1-4 credits
May be repeated for a total of eight credits. Prerequisite: permission of department head and instructor. Specific area of study in written and behavioral foundations of education determined in advance by student and faculty advisor.

ELEMENTARY EDUCATION
5200:

511 CREATIVE TECHNIQUES FOR EXPLORING CHILDREN'S LITERATURE 3 credits
Prerequisite: 286. Examination of techniques for interpretation of children's literature including appreciation, creative drama, reader's theatre and children's books.

535 ACTIVITIES TO INDIVIDUALIZE SOCIAL STUDIES 2 credits
Prerequisite: 338. Development of social studies materials and activities for using social studies materials and activities in the classroom. Procedures for development of important social concepts and measurement skills.

537 STRUCTURE OF THE NUMBER SYSTEM IN ELEMENTARY SCHOOL MATHEMATICS 3 credits
Prerequisite: 306. Applied advanced topics in mathematics education in elementary school. Emphasis on development of number system currently being taught in elementary school.

538 MATERIALS AND LABORATORY TECHNIQUES IN ELEMENTARY SCHOOL MATHEMATICS 3 credits
Prerequisites: 338. Development of materials and activities for teaching mathematics in the elementary school. Procedures for development of important topics in mathematics through the laboratory approach.

539 PROBLEMS OF NUMBERS IN ELEMENTARY SCHOOL MATHEMATICS 3 credits
Prerequisite: 306. Investigation of those numerical properties that help explain the laws of arithmetic. Procedures for development of important arithmetical concepts and computational skills.

540 CONTEMPORARY ELEMENTARY SCHOOL SCIENCE PROGRAMS 2 credits
Prerequisite: 320. Contemporary elementary science programs critically analyzed and evaluated. Procedure developed and implemented in University classroom.

590, 592, 594 WORKSHOP 1-3 credits
Elective workshops for elementary education majors who would pursue further refinement of teaching skills. Emphasizes demonstrations of teaching techniques and development of effective teaching devices.

594 EDUCATIONAL INSTITUTES
Special courses designed as inservice upgrading programs. Frequently provided with the support of national foundations.

620 LITERATURE FOR YOUNG CHILDREN 2 credits
Prerequisite: 286. Literature for children ages two through six examined in the context of development of early childhood literature. Includes children's literature, creative drama, reader's theatre and children's books.

630 ELEMENTARY SCHOOL CURRICULUM AND INSTRUCTION 3 credits
Prerequisite: 306. Introduction to the elementary school curriculum and instructional methods and techniques. Emphasis on the use of all curricular materials and methods for the effective teaching of reading and writing.

640 TRENDS IN ELEMENTARY EDUCATION 2 credits
Prerequisite: graduate standing and 650. Exploration of innovative programs, organizational patterns and new curricula currently operational in elementary schools including analysis of use of these new curricular programs in relation to traditional teaching practices.

640 THEORY AND PRACTICE IN ELEMENTARY SCHOOL MATHEMATICS 2 credits
Prerequisites: 338 and 340. Comparative analysis and evaluation of materials and procedures of mathematics programs with emphasis on new curricular directions and current instructional methods and manuals.

641 DIAGNOSIS AND TREATMENT OF PERFORMANCE DIFFicultIES IN ELEMENTARY SCHOOL MATHEMATICS 2 credits
Prerequisite: 330. Examination of implications of contemporary mathematics learning theories in the diagnosis and remedial process.

455 PROBLEMS IN ELEMENTARY SCIENCE EDUCATION 2 credits
Prerequisite: 320. Examination of influence of new curricular design in elementary science. Emphasis on inquiry, investigation and discovery and their impact on elementary school curriculum.
EDUCATION AND THE YOUNG CHILD 2 credits
Content centeredd on educational settings of young children from birth through five years.

INDIVIDUALIZED INSTRUCTION: LEARNING STYLE IDENTIFICATION AND RESOURCE PRESRIPTION 3 credits
Prequisites: permission of instructor and 530. Individual learning style characteristics, practical approaches in individualization of instruction, multimedia resource development and evaluation.

FIELD EXPERIENCE: MASTERS 1-2 credits each
Prerequisites: permission of advisor and department head. On-the-job experience related to student's course of study.

INDEPENDENT STUDY 1-3 credits
Prerequisites: permission of advisor and department head. Selected areas of independent investigation as determined by advisor and related to student's academic needs.

MASTERS PROGRAM 2-4 credits
Prerequisites: 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 a problem in elementary education.

MASTERS THESIS 4-6 credits
Prerequisites: 5200:640 and permission of advisor and department head. Indepth research investigation. Student must be able to demonstrate necessary competencies to deal with research problems in elementary education.

SUPERVISION OF INSTRUCTION IN THE ELEMENTARY SCHOOL 2 credits
Supervisory role of elementary principal and other supervisory personnel.

SEMINAR IN ELEMENTARY EDUCATION 2 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.

RESIDENCY SEMINAR 2 credits
Two-hour weekly meeting for elementary doctoral student in residence.

RESEARCH PROJECTS IN ELEMENTARY EDUCATION 1-2 credits each
Prerequisites: permission of advisor and department head. In-depth investigation of specific problem pertinent to elementary education.

FIELD EXPERIENCE FOR ELEMENTARY DOCTORAL STUDENT 1-2 credits each
Prerequisites: permission of advisor and department head. Designed to help student preparing to teach methods course at college level.

INDEPENDENT STUDY 1-3 credits
(May be repeated) A total of six credits. Prerequisites: permission of advisor and department head. Selected areas of independent investigation as determined by advisor and related to student's academic needs.

DOCTORAL DISSERTATION 1-20 credits
Prerequisites: permission of advisor and department head. Study and in-depth analysis of a research problem in elementary education.

READING 5250:

MATERIALS AND ORGANIZATIONS FOR READING INSTRUCTION 3 credits
Prerequisite: 5200:339. Professional programs of selection and evaluation of reading materials and classroom organizations explored.

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 provide reading achievement in content subjects by the elementary classroom teacher.

LANGUAGE AND ITS RELATIONSHIP TO READING IN THE ELEMENTARY SCHOOL 3 credits
Prerequisite: 5200:337. Prerequisite: 5200:337 or permission of 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-8.

TEACHING READING TO CULTURALLY DIFFERENT LEARNERS 2 credits
Prerequisite: 5200:337 or permission of instructor. The course is designed to provide the student with knowledge, skills and attitudes which will enable employment of effective methods of teaching reading to culturally different learners, and to meet the needs of language patterns as nonstandard.

TRENDS IN READING INSTRUCTION 2 credits
Prerequisite: 5200:336 or 5200:565. Survey course designed to update reading background of student who has not had a recent course in reading.

DIAGNOSIS AND CORRECTION OF READING PROBLEMS 5 credits
Prerequisite: 5200:440. Principles of growth to reading development and reasons for retardation. Implementation of diagnostic and corrective techniques by developing case studies in supervised setting.

CUNICAL PRACTICES IN READING 5 credits
Prerequisite: 5200:440. Nature and etiology of reading difficulties experienced by selected children. Supervised practices and independent work with children in conjunction with staff from other disciplines.

DIAGNOSIS FOR SCHOOL PSYCHOLOGISTS AND SUPPORT PERSONNEL 3 credits
Prerequisite: 5200:330 or permission of instructor. This course will survey developmental reading and its relationship to reading difficulties. Formal and informal procedures for diagnosing disordered readers and articulation of prescriptive strategies will be included.

ADVANCED STUDY AND RESEARCH IN READING INSTRUCTION 2 credits
Survey of research compression and evaluation of programs, design and development of projects in reading through group/paired study.

SUPERVISION & CURRICULUM DEVELOPMENT IN READING INSTRUCTION 2 credits
Relative to top 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:

ADVANCED MICROCOMPUTER APPLICATIONS IN THE SECONDARY SCHOOL 3 credits (20 or 40 hour-half)
Prerequisite: knowledge of BASIC programming is required. Advanced programming techniques, algorithms, and in-program development skills for the secondary school. Hardware, software, computer potential and limitations, language, program types, will be evaluated according to research findings and criteria appropriate to secondary schools.

INSTRUCTIONAL AND MANAGEMENT PRACTICES 3 credits
Prerequisite: 580. Students learn to use both teaching models and management strategies to achieve effectiveness in instruction. Also included are educational issues relating to effective management and instruction.

CONCEPTS AND CURRICULUM DESIGNS IN ECONOMIC EDUCATION 3 credits
Economic education concepts appropriate for high school level. Development of economic education materials for developing high school level courses.

VOCATIONAL BUSINESS EDUCATION 3 credits
Prerequisite: senior status of permission. Principles of program construction, organization, implementation, evaluation, improvement, and development of program guides for both intensive and cooperative vocational/business education.

1,2,3 WORKSHOP 1-3 credits each
Individual work under staff guidance on curriculum problems. Validation of community planning of curriculum units.

EDUCATIONAL INSTITUTES 16 credits
Special courses designed as in-service upgrading programs, frequently provided with the support of national foundations.

SECONDARY SCHOOL CURRICULUM AND INSTRUCTION 2 credits
Application of findings of research to curriculum building and procedures in teaching.

READING PROGRAMS IN SECONDARY SCHOOLS 2 credits
For subject teachers who have not previously studied in the teaching of reading. Materials, organization and procedures for diagnosing and planning reading improvement programs for all secondary schools and colleges.

ADVANCED INSTRUCTIONAL TECHNIQUES IN BOOKKEEPING - ACCOUNTING AND BUSINESS SUBJECTS 3 credits
In-depth examination of teaching-learning strategies for improvement of instruction. Emphasis on teacher coordination of methods, prepares objectives and evaluation to ensure maximum student competency in subject knowledge and skill.

ADVANCED INSTRUCTIONAL TECHNIQUES IN TYPEWRITING AND RELATED SUBJECTS 3 credits
In-depth examination of teaching-learning strategies for improvement of instruction. Emphasis on teacher coordination of methods, prepares objectives and evaluation to ensure maximum student competency in subject knowledge and skill.

FIELD EXPERIENCE MASTERS 4-6 credits
(May be repeated for a total of six credits) Prerequisites: permission of advisor and supervisor and evidence of field experience. Field experience required to student's program of studies.

INDEPENDENT STUDY 1-2 credits
(May be repeated for a total of six credits). Prerequisites: permission of advisor and supervisor and evidence of field experience. Field experience required to student's program of studies.

MASTERS PROGRAM 2 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 a problem in secondary education.

MASTER'S THESIS 4-6 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 a problem in secondary education.

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 at secondary school supervision.

SEMINAR IN SECONDARY EDUCATION 2 credits
(May be repeated) In-depth examination of a particular area at secondary education.

RESIDENCY SEMINAR 1 credit
Must be repeated. One-hour weekly meeting for secondary education doctoral student in residence.

RESIDENCY SEMINAR 1 credit
Must be repeated. One-hour weekly meeting for secondary education doctoral student in residence.

FIELD EXPERIENCE: DOCTORAL 1-6 credits
(May be repeated for a total of six credits) Prerequisites: permission of advisor and director of field experience. Intensive pre-service experience pertinent to student's needs. Student must be able to demonstrate skills and leadership abilities in an on-the-job situation.

INDEPENDENT STUDY 1-6 credits
(May be repeated for a total of six credits) Prerequisites: permission of advisor and director of field experience. Intensive pre-service experience pertinent to student's needs. Student must be able to demonstrate skills and leadership abilities in an on-the-job situation.

RESEARCH PROJECT IN SPECIAL AREAS 1-2 credits
Prerequisite: permission of advisor. Critical and indepth study of specific problem in secondary education.

DOCTORAL DISSERTATION 1-20 credits
Prerequisite: permission of advisor. Specific research problem that requires student to apply research skills and techniques pertinent to problem being solved.
TECHNICAL AND VOCATIONAL EDUCATION

5400:

500 THE POSTSECONDARY LEARNER
3 credits
Describes the access to, role of the postsecondary learner; student issues, factors, and strategies essential to successful facilitation of learning in a variety of postsecondary learning environments.

505 OCCUPATIONAL EDUCATION FOR YOUTH AND ADULTS
3 credits
History and operations of current vocational education for youth and adults. Includes study of social, economic and political influences that stimulate growth and expansion of vocational education.

510 THE TWO-YEAR COLLEGE
3 credits
Designed to introduce students to the nature, purpose and philosophy of the two-year college. Includes examination of the roles of institutions offering two-year programs.

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 in an industrial trainer or training supervisor. Techniques of instruction and solicitation are included.

521 INSTRUCTIONAL TECHNIQUES IN TECHNICAL EDUCATION
4 credits
Selected topics instructional techniques appropriate to post-secondary technical education. Emphasis on instructional methods, techniques to classroom, laboratory, including tests, measures.

530 CURRICULUM DEVELOPMENT IN TECHNICAL EDUCATION
2 credits
Procedure of breaking down an occupation to determine curriculum for laboratory and classroom, developing this concept into an organized sequence of instructional units.

531 CURRICULUM DEVELOPMENT FOR TECHNICAL EDUCATION LAB
1 credit
Prerequisite: Admission to Technical Education program or permission of instructor. Corequisites: 530. The development of a curriculum for a technical postsecondary program.

535 INSTRUCTIONAL TECHNIQUES IN TECHNICAL EDUCATION
4 credits
Prerequisite: 530. Selected topics of instructional techniques appropriate to postsecondary technical education. Emphasis is placed on instructional techniques in the classroom, laboratory, including tests, measures.

541 EDUCATIONAL GERONTOLOGY SEMINAR
3 credits
Designed to familiarize students in the field of gerontology or preparing for a specialization in educational gerontology, including personal significance 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, techniques, job description and analysis. Individualized study guides, in-class and on-the-job observation.

560 L2 WORKSHOP
1-2 credits each
Individual work under staff guidance on curriculum problems, utilization of community resources planning curriculum units.

569 EDUCATIONAL INSTITUTES
1-4 credits
Special courses designed for in-service upgrading programs, frequently provided with the support of national foundations.

610 COMMUNICATION WITH BUSINESS AND INDUSTRY
2 credits
Techniques of establishing better communications between education and business and industry. Emphasis on the role of advisory committees and coordination functions and working with local professional associations in the community.

661 CURRENT ISSUES IN HIGHER EDUCATION
2 credits
May be repeated with change in topic. Examination of current problems and issues in higher education, general education, community colleges, professional schools, graduate and professional education.

690 INTERNSHIP: TEACHING VOCATIONAL EDUCATION
2 credits each
Teaching under supervision from the University and the educational institution. Includes a terminal degree weekly.

695 FIELD EXPERIENCE: MASTERS
1-6 credits (180-360 field hours)
Prerequisites: permission of advisor and supervisor of field experience. On-the-job experience related to student's program of studies.

697 INDEPENDENT STUDY: WORKSHOP
1-3 credits (90-96 field hours)
May be repeated for a total of six credits. Prerequisites: permission of advisor and supervisor of field experience. On-the-job experience related to student's program of studies.

698 MASTERS 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 a problem in vocational education.

699 MASTERS THESIS
4-6 credits
Prerequisite permission of advisor. 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:

535 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 neurodevelopmental model and alternative methods. Three hour lecture.

541 ADVANCED ATHLETIC INJURY MANAGEMENT
4 credits (30 clinical hours)
Prerequisites: 3100/2090, 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.

547 THERAPEUTIC MODALITIES AND EQUIPMENT IN SPORTS MEDICINE
3 credits (20 clinical hours)
Prerequisites: 3100/2090, 5550/240. Purpose is to develop techniques and skills among sport medicine personnel in the recognition and implementation of therapeutic modalities and the equipment used in the rehabilitation of injured athletes.

551 ASSESSMENT AND EVALUATION IN ADAPTED PHYSICAL EDUCATION
3 credits (20 clinical hours)
Prerequisites: Permission of advisor, investigation analysis, and selection of appropriate assessment instruments, as well as methodology for determining instructional objectives and activities for handicapped students. Three hour lecture.

555 MOTOR DEVELOPMENT FOR SPECIAL POPULATIONS
3 credits
Prerequisites: Permission of advisor. Task analysis essential to structuring activity sequences for motor skills and lifetime fitness activities for handicapped children. Three hour lecture.

560 WORKSHOP
1-3 credits
Practical, intensive, and co-ordinated involvement with current curricular practices in areas related to physical education.

593 EDUCATIONAL INSTITUTES AND FOUNDATIONS
4 credits
Prerequisites: 5550/240. Selection of current curricular practices involving expert resource person with physical education, and usually financed by private or public funding.

601 ADMINISTRATION OF PHYSICAL EDUCATION, ATHLETICS AND CAMPUS RECREATION
3 credits
Prerequisites: 5550/240. Techniques of organization, administration, evaluation of physical education, athletics, and campus recreation programs. Policies and procedures for K-12 program are emphasized.

661 CURRICULUM PLANNING IN HEALTH AND PHYSICAL EDUCATION
2 credits
Analysis of objectives, procedures and trends in curriculum and principles and procedures for developing sound programs.

664 PHYSIOLOGY OF MUSCULAR ACTIVITY AND EXERCISE
3 credits
Functions of body systems and physiological effects of exercise. Laboratory experiments, lectures, discussions.

680 STATISTICS: QUANTITATIVE AND QUALITATIVE METHODS
3 credits
Prerequisite: 5550/240. Research methodology, statistics, nullification and interpretation, use of computers and laboratory software as they relate to various disciplines in the area of physical activity.

684 SUPERVISION OF PHYSICAL EDUCATION
2 credits
Principles involved in supervision of physical education service programs. Procedures and techniques of supervision of service classes at elementary, junior high and senior high school levels.

695 MOTIVATIONAL ASPECTS OF PHYSICAL ACTIVITY
3 credits
Analysis of factors influencing motivation of motor performance with emphasis on compensation, audience effects, aggression.

698 SPECIAL TOPICS IN HEALTH AND PHYSICAL EDUCATION
2-4 credits
May be repeated. Prerequisites: Permission of instructor. Group study of special topics in health and physical education and sports medicine.

699 FIELD EXPERIENCE: MASTERS
1-6 credits
Prerequisite: Permission of advisor. Participation in a work experience related to physical education. The experience may not be part of current position. Documentation of project required.

699 INDEPENDENT STUDY
1-3 credits
Prerequisite: Permission of advisor. In-depth analysis of current practice or problems related to physical education. Documentation of the study required.

699 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 a problem in physical education.

699 MASTER'S THESIS
4-6 credits
Prerequisite: Permission of advisor. 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 SOCCER CURRICULUM
4 credits
Prerequisites: 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
Prerequisites: instructional techniques which are applicable to outdoor education; in-depth study of methods and designs, unique to the process of teaching.

556 OUTDOOR PURSUITS
4 credits
Investigation and participation in project experiences in outdoor pursuits.

590 WORKSHOP: OUTDOOR EDUCATION
1-3 credits
Practical application of contemporary ideas, methodologies, knowledge relevant to outdoor education. Emphasis on participant involvement in educational practices, utilizing the natural environment.

599 EDUCATIONAL INSTITUTES: OUTDOOR EDUCATION
1-4 credits
Prerequisites: 5550 or 557. Utilization of resources of outdoor area as a learning/thinking environment. Content and methodology appropriate for teaching school-age children in rural setting.

600 OUTDOOR EDUCATION: SPECIAL TOPICS
4 credits
Prerequisite: permission of instructor. Group work in study of special topics of contemporary concern in outdoor education.

600 PRACTICUM IN OUTDOOR EDUCATION
2-4 credits (60-120 field hours)
Prerequisites: 559, 552 and permission of advisor. Supervised practical experience with existing or new outdoor education programs. In conjunction with practical work student meets regularly with advisor.

599 FIELD EXPERIENCE: MASTERS
2-4 credits (80-160 field hours)
Prerequisite: permission of advisor. Participation and documentation of practical professional experience related to outdoor education.

699 INDEPENDENT STUDY
1-3 credits (10-30 field hours)
Prerequisite: permission of advisor. In-depth analysis of current practices or problems related to outdoor education. Documentation of study required.

699 MASTER'S PROBLEM
2-4 credits
Prerequisite: permission of advisor. Intensive 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.
### Courses of Instruction

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<th>Course Code</th>
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<td>Career Education</td>
<td>2 credits</td>
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<td>553</td>
<td>Counseling Problems Related to Life-Threatening Illness and Death</td>
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<td>554</td>
<td>Work</td>
<td>1-3 credits</td>
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<td>555</td>
<td>Special Program</td>
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<tr>
<td>560</td>
<td>Seminar in Counseling</td>
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<td>561</td>
<td>Seminar in Elementary School Counseling</td>
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<td>567</td>
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<td>568</td>
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<td>570</td>
<td>Career Exploration</td>
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<td>571</td>
<td>Organization and Administration of Guidance Services</td>
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<td>573</td>
<td>Seminar in Counseling</td>
<td>3 credits</td>
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<td>574</td>
<td>Martial Therapy</td>
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### EDUCATIONAL GUIDANCE AND COUNSELING

552: **Career Education**
- Prerequisite: Junior or senior year standing. Examination of current career education models and programs with emphasis on infusions of career education activities into elementary and secondary curricula.

553: **Counseling Problems Related to Life-Threatening Illness and Death**
- Prerequisite: permission. Consideration of the global issues, current research, coping behavior, support systems and family and individual needs in regard to life-threatening situations.

554: **Work**
- Special instruction designed as in-service and/or upgrading individuals on current issues and practices in counseling.

555: **Special Program**
- Special instruction designed as in-service and/or upgrading individuals on current issues and practices in counseling.

560: **Seminar in Counseling**
- 1 credit
- Prerequisite: counseling majors must elect 660 prior to selecting 661 and/or within the first 10 credits of 5600 course work. Structured group experience designed to help students assess and focus on the role of counseling as a profession.

561: **Seminar in Elementary School Counseling**
- 3 credits
- Introduction to courses, examinations, guidance and counseling practices.

562: **Seminar in Secondary School Counseling**
- 3 credits
- Overview of community and college counseling services; their evaluation, philosophy, organization and administration.

563: **Seminar in Community Counseling**
- 3 credits
- Introduction to courses, examinations, guidance and counseling practices.

564: **Multicultural Counseling**
- 3 credits
- Prerequisite: 562 or permission of instructor. An examination of multicultural counseling theories and research necessary to work with culturally diverse peoples.

565: **Career Development and Counseling Across the Life-Span**
- 3 credits
- Overview of career development and choice over the life-span. Personal, family, and social characteristics that influence career choice are discussed.

566: **Individual and Family Development Across the Life-Span**
- 3 credits
- Examination of individual and family development. Emphasis will be placed on understanding the relationship between the individual and family. Family counseling issues discussed.

567: **Counseling and Personnel Services in Higher Education**
- 3 credits
- Prerequisite: 565 or permission of instructor. Counseling services as related to psychological needs of college-age students.

568: **Techniques of Counseling**
- 3 credits
- Prerequisite: 563 or permission. Study and practice of selected counseling techniques and skills with emphasis on structuring, silence, leading and establishing a counseling relationship. Case studies in counseling will be reviewed.

569: **Organization and Administration of Guidance Services**
- 3 credits
- Prerequisite: 661 or 663 or permission. Development of a comprehensive articulation guide for counseling programs.

570: **Seminar in Guidance**
- 2 credits
- Prerequisites: 645, 647, 653 and 655. Primary models for understanding and modifying children's behavior in classroom including techniques for observing and recording guidance materials and programs.

571: **Seminar in School Counseling**
- 3 credits
- Prerequisites: 633, 641, 945 and 647. Study of specific guidance techniques and materials useful to counselors working with the secondary school student, teacher and parents.

572: **Seminar in 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 interest.

573: **Martial Therapy**
- 3 credits
- Prerequisite: 665. In-depth study of theories and interventions which focus on the nature and quality of marital relationships.
SPECIAL EDUCATION

5610:

1. DEVELOPMENTAL CHARACTERISTICS OF EXCEPTIONAL INDIVIDUALS
   - Identification, developmental characteristics, and treatment procedures for physically and emotionally handicapped children and youth in both regular and special education settings.
   - Credits: 3

2. DEVELOPMENTAL CHARACTERISTICS OF THE MENTALLY RETARDED
   - Focuses on the identification, diagnosis, classification, and developmental characteristics of mentally retarded and developmentally disabled individuals.
   - Credits: 3

3. DEVELOPMENTAL CHARACTERISTICS OF THE SPECIFIC LEARNING DISABLED
   - Survey of etiology, diagnosis, classification, and developmental characteristics of learning disabled individuals.
   - Credits: 3

4. DEVELOPMENTAL CHARACTERISTICS OF INTELLECTUALLY GIFTED INDIVIDUALS
   - Survey of etiology, diagnosis, classification, and developmental characteristics of intellectually gifted individuals.
   - Credits: 3

5. DEVELOPMENTAL CHARACTERISTICS OF ORTHOPEDICALLY HANDICAPPED INDIVIDUALS
   - Focuses on the identification, diagnosis, classification, developmental characteristics of orthopedically handicapped individuals.
   - Credits: 3

6. DEVELOPMENTAL CHARACTERISTICS OF THE SEVERE BEHAVIOR HANDICAPPED
   - Focuses on the identification, diagnosis, developmental characteristics of the severely emotionally handicapped individuals.
   - Credits: 3

7. SPECIAL EDUCATION PROGRAMMING: EARLY CHILDHOOD
   - Focuses on typical and atypical developmental patterns in the preschool child, including factors that can affect their development.
   - Credits: 3

8. SPECIAL EDUCATION PROGRAMMING: ELEMENTARY LEVEL
   - Focuses on the identification, diagnosis, classification, and developmental characteristics of children with special needs in an educational setting.
   - Credits: 3

9. SPECIAL EDUCATION PROGRAMMING: SECONDARY VOCATIONAL
   - Focuses on the identification, diagnosis, classification, and developmental characteristics of adolescents with special needs in a vocational setting.
   - Credits: 3

10. COMMUNICATION AND CONSULTATION WITH PARENTS AND PROFESSIONALS
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of professionals involved in special education.
    - Credits: 3

11. TECHNOLOGY AND MATERIALS APPLICATION IN SPECIAL EDUCATION
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of materials and technology used in special education.
    - Credits: 3

12. EDUCATIONAL ASSESSMENT IN THE REGULAR CLASSROOM
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of educational assessment techniques in a regular classroom setting.
    - Credits: 3

13. ASSESSMENT IN SPECIAL EDUCATION
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of assessment procedures and techniques used in special education.
    - Credits: 3

14. NEUROMOTOR ASPECTS OF PHYSICAL DISABILITIES
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of physical disabilities.
    - Credits: 3

15. NEUROMOTOR ASPECTS OF SENSORY DISABILITIES
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of sensory disabilities.
    - Credits: 3

16. NEUROMOTOR ASPECTS OF BEHAVIORAL DISABILITIES
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of behavioral disabilities.
    - Credits: 3

17. CLINICAL PRACTICUM IN SPECIAL EDUCATION
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of clinical practicum in special education.
    - Credits: 3

18. SEMINAR: INVITATIONAL STUDIES IN SPECIAL EDUCATION
    - Focuses on the identification, diagnosis, classification, and developmental characteristics of invited seminars in special education.
    - Credits: 3
MULTICULTURAL EDUCATION
5630:
581 MULTICULTURAL EDUCATION IN UNITED STATES
3 credits
582 CHARACTERISTICS OF CULTURALLY DIFFERENT YOUTH
3 credits
583 PREPARATION FOR TEACHING CULTURALLY DIFFERENT YOUTH
3 credits
584 PRINCIPLES OF BILINGUAL/MULTICULTURAL EDUCATION
3 credits
585 TEACHING READING AND LANGUAGE ARTS TO BILINGUAL STUDENTS
4 credits
586 TEACHING MATHEMATICS, SOCIAL STUDIES AND SCIENCE TO BILINGUAL STUDENTS
3 credits
587 TECHNOLOGIES FOR TEACHING ENGLISH AS A SECOND LANGUAGE IN THE BILINGUAL CLASSROOM
4 credits
588 WORKSHOP: BILINGUAL/MULTICULTURAL
1-3 credits
589 SEMINAR: EDUCATION OF THE CULTURALLY DIFFERENT
2 credits

EDUCATIONAL ADMINISTRATION
5700:
590,1,2 WORKSHOP
1-3 credits
594 EDUCATIONAL INSTITUTES
1-4 credits
601 PRINCIPLES OF EDUCATIONAL ADMINISTRATION
3 credits
602 SCHOOL BUSINESS ADMINISTRATION
2 credits
603 ADMINISTRATION OF EDUCATIONAL PERSONNEL
2 credits

SCHOOL-COMMUNITY RELATIONS
3 credits
Evaluation of the principles, practices, and materials that facilitate the adjustment and integration of students to their internal and external publics.

EVALUATION IN EDUCATIONAL ADMINISTRATION
3 credits
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.

SCHOOL LAW
2 credits
An examination of the legal principles underlying education in United States as reflected in statutes, regulations, court decisions and administrative orders.

SCHOOL FINANCE AND ECONOMICS
3 credits
A study of financial operations of school systems, including taxes, other sources of revenue, expenditures, budgeting and analysis of economic factors.

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.

PRINCIPLES OF EDUCATIONAL SUPERVISION
3 credits
Study of principles, organization and techniques of supervision with view to improvement of instruction.

SUPERVISION OF STUDENT TEACHING
2 credits
Primarily for supervising teachers in guidance of student teachers. Topics include readiness of student teaching, directing teachers and college supervisor relationships, use of the conference, demonstration and observation.

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.

ADMINISTRATION OF PUPIL SERVICES
2 credits
Overviews of pupil services including analysis of the nature and development of each component program and disposition of current issues and trends.

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.

SECONDARY SCHOOL ADMINISTRATION
3 credits
An introduction to the secondary school role and working relationships and an examination of the principles and strategies involved in successfully administering a secondary school.

ELEMENTARY SCHOOL ADMINISTRATION
3 credits
Examination of the elementary school role and its relationship to the development and maintenance of a school climate conducive to learning.

FIELD EXPERIENCE I: ELEMENTARY ADMINISTRATION
2 credits
A cooperative field-based internship in an elementary school involving observation and activities in the administrative task areas.

FIELD EXPERIENCE II: ELEMENTARY ADMINISTRATION
2 credits
Prerequisite: 590 and permission of instructor. Culmination of the preparatory program for elementary school principals in which students perform administrative tasks supervised by experienced principals.

FIELD EXPERIENCE FOR SUPERVISORS
2 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-services/staff development, growth and action research.

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.

INDEPENDENT STUDY
1-3 credits
(May be repeated for a total of six credits) Prerequisites: permission of advisor and supervisor of the independent study. Area of student determined by student's needs.

MASTER’S PROBLEM
2 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 a problem in educational administration.

MASTER’S THESIS
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 a problem in educational administration.

ADVANCED PRINCIPLES OF EDUCATIONAL ADMINISTRATION
2 credits
Study of organizations and strengths and weaknesses of common methods of administrating them. Practical means by which overcoming bureaucratic weaknesses of bureaucracies are often or lessened in educational institutions.

DECISION MAKING IN EDUCATIONAL ADMINISTRATION
3 credits
Decision making portrayed as a central function of the educational administrator with a unidimensional presentation of the theory, research and practice of decision making.

COLLECTIVE BARGAINING AND EMPLOYER 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.

THE SUPERINTENDENCY
3 credits
An overview to the superintendent's role and an examination of the strategies for dealing with the major relational and functional aspects of the superintendency.

TOPICAL SEMINAR: EDUCATIONAL ADMINISTRATION
1-3 credits
May be repeated. Prerequisite: permission of instructor. Topics may include special areas, such as school board relations, school management, administration, finance, central office relations, state and federal laws, public relations, personnel issues, and personnel policies.

RESIDENCY SEMINAR
3 credits
Prerequisite: 590. Focus on recent research in administration and educational administration theories.

RESIDENCY SEMINAR
3 credits
Current administrative problems in educational institutions as perceived by students and practicing school executives. Emphasis on problem formulation, analysis and solution. Field visits or resource persons invited to classroom.

ORGANIZATIONAL COMMUNICATIONS AND THE SCHOOL ADMINISTRATOR
3 credits
Focuses on interpersonal communication skills of educational administrators. Content development in written and spoken communications, with attention to nonverbal communications, situation and role playing.
SPECIAL EDUCATIONAL PROGRAMS

5800:

590 WORKSHOP IN ECONOMIC EDUCATION OR IN SOCIAL STUDIES 3 credits
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.

591 WORKSHOP IN ARITHMETIC OR PHYSICAL SCIENCE 3 credits
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.

592 WORKSHOP IN READING 3 credits
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.

593 WORKSHOP ON EXCEPTIONAL CHILDREN 3 credits
Individual work under staff guidance on curriculum problems; utilization of community resources; planning of curriculum units.

594 INTERNATIONAL SCHOOL STUDY 3 credits
On-the-scene study of education in foreign countries, usually by concentrating on the study of schools in one restricted geographical area.

HIGHER EDUCATION ADMINISTRATION

5900:

700 INTRODUCTORY ADMINISTRATIVE COLLOQUIUM IN HIGHER EDUCATION 3 credits
Introduction to the organization and administration of higher education institutions.

715 SEMINAR IN HIGHER EDUCATION ADMINISTRATION IN HIGHER EDUCATION 3 credits
Prerequisite: 5700 or 704 or permission. In-depth study of problems, procedures and principles of administration in institutions of higher education. Emphasis is placed on the administrative process and its impact on the institution.

720 FINANCE AND HIGHER EDUCATION 3 credits
Prerequisite: permission of the instructor. Focuses on the financial management of higher education institutions.

721 LAW AND HIGHER EDUCATION 3 credits
Prerequisite: permission of the instructor. Focuses on the legal aspects of higher education, including principles of law and their application.

725 SEMINAR IN HIGHER EDUCATION STUDENT SERVICES 3 credits
Prerequisite: permission of the instructor. Focuses on the administration and management of student services in higher education.

730 HIGHER EDUCATION CURRICULUM AND PROGRAM PLANNING 3 credits
Prerequisite: permission of the instructor. Focuses on the planning and development of curriculum and programs in higher education.

735 INSTRUCTIONAL STRATEGIES AND TECHNIQUES FOR THE COLLEGE INSTRUCTOR 3 credits
Prerequisite: permission of the instructor. Focuses on instructional strategies and techniques for college instructors.
ACCOUNTANCY

6200:

520 ADVANCED ACCOUNTING
Prerequisite: 318. Examination of accounting theory emphasizing accounting for business combinations, partnerships, foreign operations, nonprofit entities and consolidated statements.

530 TAXATION
Prerequisite: 520. Application of current federal tax law to individuals and proprietorships. Types of income, deductions and structure of tax return covered. Muster of Taxation students will not be able to take this course to satisfy tax electives in the Master of Taxation program.

550 ADMINISTRATION
Prerequisite: 430/530. Application of current federal tax law to partnerships, corporations, trusts, estates and gifts. Social security taxes and Ohio income, sales and personal property taxes discussed.

540 AUDITING
Prerequisites: 218, 219, 220, 355 and 6500.232 must be taken prior to or concurrently, or permission of instructor. Examination and interpretation of financial statements and related procedures used by independent auditor in determining whether a firm has fairly represented its financial position.

570 GOVERNMENTAL AND INSTITUTIONAL ACCOUNTING
Prerequisite: 250 or 630. Further emphasis on graduate-student level. Theory and procedures involved in application of fund accounting, budgetary control, appropriations and various accounting systems in governmental units, educational and other nonprofit institutions.

580 ACCOUNTING PROBLEMS
Prerequisite: 318. Independent research on advanced accounting problem of student's specific area of interest.

588 CPA PROBLEMS: AUDITING
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
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
Prerequisite: permission of instructor. Opportunity to study special topics and current issues in accounting. May be repeated with change of subject but not to exceed 6 credits.

591 WORKSHOP IN ACCOUNTING
Prerequisite: 590. May be repeated. Prerequisite: permission of instructor. Group study of accounting under faculty guidance. May be used to meet undergraduate graduate-student level requirements, but may be used for elective credit only with permission of instructor or department.

601 FINANCIAL ACCOUNTING
Introduction; course for students with no accounting background. Examines accounting principles as applied to financial problems of firm.

603 BUSINESS SYSTEMS WITH MICROPROCESSING APPLICATIONS
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
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 flow of information.

627 SURVEY OF FEDERAL TAXATION
Prerequisites: 67 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
Prerequisites: 67 or equivalent. Designed to develop basic research competence involving federal income, estate, gift and tax laws.

631 CORPORATE TAXATION I
Prerequisite: 430. Detailed examination of tax problems of corporations and their shareholders. Formation, distribution, redemption, liquidation and penalty taxes reviewed.

632 TAXATION OF TRANSACTIONS IN PROPERTY
Prerequisite: 430. Explores federal tax implications of gains and losses derived from sales, exchanges and other dispositions of property.

633 ESTATES AND GIFT TAXATION
Prerequisite: 430. Analyzes provisions of federal estate and gift tax laws and the consequences of testamentary and lifetime transfers.

637 ADVANCED ACCOUNTING THEORY
Prerequisite: 416. Examination of accounting concepts and standards through critical analysis of articles on current trends in profession. Discussion and outside research-stressed.

640 ADVANCED AUDITING
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 OWNERSHIPS AND CORPORATION
Prerequisite: 430. Examines interstaxi provisions of subchapter K and S of Internal Revenue Code and uses of partnerships and Subchapter S corporations for tax-planning.

642 CORPORATE TAXATION II
Prerequisite: 631. Continuation of 431. Concludes study of subchapter C of Internal Revenue Code with major focus on corporate reorganization.

643 TAX ACCOUNTING
Prerequisite: 430. 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
Prerequisite: 430. An indepth 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
Prerequisite: 430. Indepth study of some of the more involved areas of individual income taxation.

646 CONSOLIDATED TAX RETURNS
Prerequisite: 430. Introductory tax course covering consolidated returns.

647 QUALIFIED PENSIONS AND PROFIT SHARING
Prerequisite: 430. 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
Prerequisite: 430. Indepth study of administration and procedures of Internal Revenue Service and responsibilities of tax practitioners.

649 STATE AND LOCAL TAXATION
Prerequisite: 631. Examines common types of taxes imposed by state and local governments and excludes taxation of multistate businesses.

650 ESTATE PLANNING
Prerequisite: 633. Consideration of 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
Prerequisite: 630. 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
Prerequisite: 430. Analysis of tax aspects of tax-exempt organizations, including nature of and limitations of their exemption.

653 BUSINESS PLANNING
Prerequisite: 621. Uses cases depicting complex problems to permit student to integrate knowledge of taxation.

654 INDEPENDENT STUDY IN TAXATION
Prerequisite: permission of instructor. Intensive study of particular topics or limited number of topics not otherwise offered in curriculum.

655 ADVANCED INFORMATION SYSTEMS
Prerequisites: 359 and 630. Advanced study of accounting information system theory, elements, principles, design and implementation. Practical data processing networks and networks to control flow of information.

656 NONQUALIFIED EXECUTIVE COMPENSATION
Prerequisite: 631. Various nonqualified executive compensation items are analyzed, the effects to both the recipients and employer entities are determined and discussed.

657 ADVANCED TAX RESEARCH AND POLICY
Prerequisites: 620/660 and completion of four other tax courses in Phase I. Extensive research involving federal income, estate, trust and gift taxes as well as tax policy.

664 RESEARCH AND QUANTITATIVE METHODS IN ACCOUNTING
Prerequisites: 620/660 and 6500.601 or equivalent. Survey of research techniques, statistical methods and case bases with applications to accounting and business functional areas.

670 COST CONCEPTS AND MANAGEMENT ACCOUNTING
Prerequisite: 600/650 and either 620/660 or 660. Focuses on management and control costs. Case studies of solving problems. Determination of cost data and efficiency of decision making.

680 INTERNATIONAL ACCOUNTING
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
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.

692 SELECTED TOPICS IN TAXATION
Prerequisite: 628 and completion of four tax courses. May be repeated. Prerequisite: permission of instructor. Selected topics in taxation not covered in current courses.

697 INDEPENDENT STUDY IN ACCOUNTING
Prerequisite: 628 and completion of four other tax courses. May be repeated. Prerequisite: permission of instructor. Focus on special topics of study and research in accounting.

FINANCE

6400:

591 WORKSHOP IN FINANCE
Prerequisite: 330. May be repeated. Group study of special topics. May be used to meet undergraduate graduate major requirements in finance. May be used for elective credit only with permission of instructor or department.

632 MANAGERIAL FINANCE
Prerequisites: 320/620, 321 (or 620) and 3260.201 (or 600). Emphasis on financial decision making related to goal of firm. Specifically, the investment decision the financial decision and the dividend decision.

633 LEGAL ASPECTS OF BUSINESS TRANSACTIONS
Prerequisites: 502 or equivalent. A review of major financial markets and financial institutions with an emphasis on the decision-making processes within a rapidly changing, but regulated operating environment.

631 FINANCIAL MARKETS AND INSTITUTIONS
Prerequisites: 502 or equivalent. A review of major financial markets and financial institutions with an emphasis on the decision-making processes within a rapidly changing, but regulated operating environment.
MANAGEMENT OF FINANCIAL INSTITUTIONS

633 MANAGEMENT OF DEPOSITORY FINANCIAL INSTITUTIONS 3 credits
Prerequisites: 602 and 700:602. Policy determination, administrative decision making in banks, savings and loan using computer simulation games.

645 INVESTMENT ANALYSIS 3 credits
Prerequisites: 602 and 641:601 and 602. Study of the economy 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: 645, 6500:601. A study of the application and practice of options, futures and other speculative markets.

650 ADMINISTRATIVE CONTROL 3 credits
Prerequisite: 660:601 or permission of instructor. Advanced techniques used by sophisticated individuals, professional managers of large portfolios.

850 ADMINISTERING COSTS AND PRICES 3 credits
Prerequisites: 205:600 and 206:605. Provides an understanding of managerial economics. Short- and long-run decisions of a firm analyzed. Analysis includes impact of costs and prices on profits.

945 GOVERNMENT AND BUSINESS 3 credits
Prerequisites: 210:600 and 6500:600. Public policy with regard to business institutions and issues is considered from an economic, legal, ethical, political framework.

764 FINANCIAL MANAGEMENT AND POLICY 3 credits
Prerequisites: 602 and 6500:602. Working capital management, controlling inventory, investments, reinvesting costs and funds, managing investment in plant and equipment, administering business income and forecasting for financial management.

767 MANAGEMENT OF FINANCIAL STRUCTURE 3 credits
Prerequisite: 674. Emphasizes determination of volume and composition of sources of funds. Primary attention devoted to cost of capital for sources of financing.

878 CAPITAL BUDGETING 3 credits
Prerequisite: 674. Attempt to integrate various theories of capital budgeting into a comprehensive conceptual scheme. Theoretical concepts and practical applications blend for better understanding of capital problems.

881 MULTINATIONAL CORPORATE FINANCE 3 credits
Prerequisite: 600 or equivalent. Financial policies and practices of companies involved in multinational corporate operations. Emphasis on managing capital and financial assets, return on investment and capital for the global firm.

890 SELECTED TOPICS IN FINANCE 3 credits
(May be repeated for a total of six credits) Prerequisite: 674. Provides study of current financial issues and areas not covered in current finance graduate courses.

891 INTERNATIONAL MARKETS AND INVESTMENTS 3 credits
Prerequisite: 658:601. 4000 level study on the international financial markets with emphasis on international investments and risks in a rapidly changing global economy.

892 COLLABORATION IN BUSINESS 3 credits
Prerequisite: Permission of graduate director. Study of business administration through examination of several lectures in business research and practice. A broad range of topics in business research and theory will be discussed by faculty and graduate students. May be repeated, but will not satisfy degree requirements. (6 credits only.

897 INDEPENDENT STUDY IN FINANCE 3 credits
(May be repeated for a total of three credits) Focus on special topics of study and research in finance on an independent study basis.

898 INDEPENDENT STUDY - BUSINESS LAW 1-3 credits
Focus on special topics of study and research in the legal aspects of business administration.

MANAGEMENT 6500:

500 ENTREPRENEURSHIP 3 credits
Prerequisite: upper-college or graduate standing and 301 or 600 or equivalent. Examines the behavior and environment for entrepreneurship. Focuses on the contours of organizational behavior and environment for entrepreneurship.

510 SELECTED TOPICS IN ENTREPRENEURSHIP 1-2 credits
Prerequisites: upper-college or graduate standing and 301 or 600 or equivalent. Facilitates comprehensive understanding 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
Prerequisite: upper-college or graduate standing and 301 or 600 or equivalent. Review of development of management theories from 5000 BC to present with consideration of their application to present organizational settings.

555 MANAGEMENT OF ARBITRATION: COMMERCIAL, INTERNATIONAL AND HUMAN RESOURCES 3 credits
Prerequisite: upper-college or graduate standing and 301 or 600 or equivalent. A comprehensive study of the legal issues of commercial, international and human resource arbitration.

571 MANAGEMENT PROBLEMS 3 credits
(Students who have earned credit in 471 are eligible to register for or earn credit in 472, 473, 474.) Prerequisites: 302 or 442 and 443 and senior standing. Studies modern management problems, practices, theory, and actual problem in industry.

590 INTRODUCTION TO HEALTH-CARE MANAGEMENT 3 credits
Prerequisites: 610:601 or equivalent. An introductory course for students: professionals; providing an in-depth study of the roles of management and the application of their management principles, theory, and actual problem in industry.

592 HEALTH SERVICES OPERATIONS MANAGEMENT 3 credits
Prerequisite: upper-college standing and 301 or 600 or 222 and 223 or equivalents or graduate standing and 600 or 602 or 603 or equivalent or permission of instructor. (Students who have completed 391 are ineligible to take this course for credit. Application of production and operations management concepts and techniques in health care organizations.

598 SPECIAL TOPICS IN HEALTH SERVICES ADMINISTRATION 1-2 credits
Prerequisite: permission of instructor. Special topics in health services administration (e.g., management of teaching and research) and their application to particular health care organizations and institutional delivery systems. Topic 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 the manager 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, single and multiple regression analysis, and correlation analysis, exponential smoothing, and nonparametric statistics.

602 COMPUTER TECHNIQUES FOR MANAGEMENT 3 credits
Prerequisite: 602 or equivalent. Introduction to the use of integrated spreadsheet software, database management software, and decision and database management information systems.

604 MANAGEMENT INFORMATION SYSTEMS 3 credits
Prerequisites: 602 or equivalent. An introduction to system design, management information systems, database management, and the relationship to problem solving and the organization. Cannot be taken in lieu of 620:655.

607 APPLIED DATA MANAGEMENT 3 credits
Prerequisite: 602. An in-depth evaluation of the practice of data, from collection through organization and storage to data extraction and manipulation, including uses of online databases.

608 SYSTEMS SIMULATION 3 credits
Prerequisites: 601, 602. Manufacturing or service sector systems are analyzed and modeled using computer simulation techniques, model verification and validation will be discussed.

633 EXPERT SYSTEMS IN BUSINESS 3 credits
Prerequisite: 601. Introduction to artificial intelligence in general and expert systems technology. Provides hands-on experience in designing systems for business applications using engineering software.

634 DECISION SUPPORT SYSTEMS 3 credits
Prerequisite: 600 or equivalent. Study of decision support systems and the role they play in the current business environment. Business problems are analyzed and a DSS is designed and implemented.

638 ADVANCED MANAGEMENT INFORMATION SYSTEMS 3 credits
Prerequisites: 600 or equivalent. A case-oriented course which examines the problems of managing the Corporate Information System. Emphasis is placed on the organization of data, use of available software, and the study of organizational information systems.

660 PRODUCTIVITY AND QUALITY OF WORKLIFE ISSUES 3 credits
Prerequisites: 602 or permission of instructor. A comprehensive study of innovations in organizations designed to increase human productivity and productivity through changes in human management.

663 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.

664 ORGANIZATIONAL THEORY 3 credits
Prerequisite: 652. Leadership styles in organizational settings, influence of these styles on individuals, group behavior; organizational goal attainment. Analysis of leader role in administrative process.

666 INDUSTRIAL RELATIONS 3 credits
Prerequisite: 600. Study of rights and duties of managers in dealing with labor and economic consequences of union and management policies and practices.

667 COMPENSATION ADMINISTRATION AND EMPLOYEE BENEFITS 3 credits
Prerequisite: 600. A comprehensive approach toward the identification and resolution of job and benefit problems facing business organizations in their internal and external labor markets.

668 MANAGEMENT OF INTERNATIONAL OPERATIONS 3 credits
Prerequisite: 652 or equivalent. Deals with international environment of international business, policies of international business organizations which hold the system together and which individual business people cannot materially alter.

670 THE LEADERSHIP ROLE IN ORGANIZATIONS 3 credits
Prerequisite: 602. Analysis and development of leadership theory and thought. Identifies the roles of leaders in formal and informal organizations. Training and development methods of leaders evaluated: individual and small group study assignments.

686 ECONOMIC HUMAN RESOURCE MANAGEMENT 3 credits
Prerequisites: 600, 652, 654. The formulation, design and implementation of strategic human resource practices and systems for business organizations. Emphasizes an integrative cost advantage and productivity gains.

689 OPERATIONAL AND STRATEGIC DECISION MAKING 3 credits
Prerequisites: 600, 601, 602 or equivalent. Decision making for business is examined. Emphasis is placed on the behavior, environmental, social, and community considerations and their relationship to economic criteria.

691 EMPLOYMENT DISCRIMINATION 3 credits
Prerequisite: 652 or equivalent. An overview of discrimination procedures and practices, affirmative action requirements, employee and employer disclosure and their application in human resource management.

692 APPLIED OPERATIONS RESEARCH 3 credits
Prerequisite: 651 or equivalent. Survey of basic techniques of operations research. Application to functional area of business.

693 APPLIED INDUSTRIAL STATISTICS I 2 credits
Prerequisites: 601 or equivalent. Designs for survey sampling and estimation. Simple linear regression analysis, including inferences, aptness of the model and model significance.

694 APPLIED INDUSTRIAL STATISTICS II 2 credits
Prerequisites: 601, 663. Applications of multiple regression including determination of "best" cost; independent variables, correlation models, analysis of variance models including multi-factor models. Experimental designs including randomized block and Latin square designs.

695 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.

696 ADVANCED OPERATIONS RESEARCH 3 credits
Prerequisite: 602. Designed to present in more depth and breadth certain topics surveyed in 692, with emphasis on application of these techniques to student's own business situations.

697 MANUFACTURING AND OPERATIONS ANALYSIS 3 credits
Prerequisite: 601 or equivalent. Provides an applications forum where skills gained in other manufacturing quantitative areas of curriculum can be empirically utilized and applied.
673 QUALITY AND PRODUCTIVITY TECHNIQUES 3 credits
Prerequisite: 600. Emphasis on statistical techniques for improving productivity and quality, including statistical process control (SPC), total quality management (TQM), just-in-time (JIT) inventory control and management of the quality system.

674 ADVANCED QUALITY AND PRODUCTIVITY TECHNIQUES 3 credits
Prerequisite: 673. The integration and management of quality, productivity, and statistical techniques in the total system environment.

675 MATERIALS MANAGEMENT 3 credits
Prerequisite: 600. Analysis of the functions of materials management, production, and marketing, and preparation of materials, components, and equipment.

676 MANAGEMENT OF PRODUCTION AND OPERATIONS 3 credits
Prerequisite: 600. Emphasis on the management of production and operations with particular attention to the management of the production function.

678 STRATEGIC RETAIL 5 credits
Prerequisite: 600. The retail process: implications for retail stores, integration of computer systems, and management of the total retail operation.

683 HEALTH SERVICES SYSTEMS MANAGEMENT 3 credits
Prerequisite: 680 or 600 equivalent. Focus on the management of health services organizations.

686 HEALTH SERVICES RESEARCH PROJECT 3 credits
Prerequisite: 685 or 600 equivalent. Research project selected by the student under the supervision of the instructor.

687 GRADUATE SEMINAR IN HEALTH SERVICES POLICY AND ADMINISTRATION 3 credits
Prerequisite: 580 or 600 equivalent. Advanced seminar in health services management.

688 INDEPENDENT STUDY IN HEALTH SERVICES ADMINISTRATION 1-3 credits
May be repeated for a total of three credits. Independent study under the supervision of the instructor.

690 SELECTED TOPICS IN MANAGEMENT 2 credits
May be repeated for a total of six credits. Prerequisite: 582. Selected topics in management.

695 BUSINESS STRATEGY AND POLICY DOMESTIC AND INTERNATIONAL 3 credits
Prerequisite: 690 or 600 equivalent. Focus on the strategies and policies of multinational organizations.

697 INDEPENDENT STUDY IN MANAGEMENT 1-3 credits
May be repeated for a total of three credits. Focus on special topics of study and research in management on an independent basis.

INTERNATIONAL BUSINESS 6800:

605 INTERNATIONAL BUSINESS ENVIRONMENTS 3 credits
May be repeated for a total of three credits. Focus on the international environment.

630 INTERNATIONAL MARKETING POLICIES 3 credits
Prerequisites: 600, 602, and 605. Emphasis on the selection of international marketing strategies and policies.

650 INTERNATIONAL CORPORA TIONS 3 credits
Prerequisite: 605. Advanced course designed to develop an in-depth understanding of multinational organizations and strategies.

659 SEMINAR IN INTERNATIONAL BUSINESS 3 credits
Prerequisite: 605. Seminar on current topics and issues.

697 INDEPENDENT STUDY IN INTERNATIONAL BUSINESS 1-3 credits
May be repeated for a total of three credits. Focus on special topics of study and research in international business on an independent basis.
HOME ECONOMICS AND FAMILY ECOLOGY

7400:

501 FAMILY LIVING PATTERNS IN THE ECONOMICALLY DEPRIVED HOME 2 credits
Study of family life orientation and lifestyle patterns among economically deprived with emphasis on impact on socioeconomic and psychosocial problems on family members throughout family life span.

503 ADVANCED FOOD PREPARATION 3 credits

505 FAMILY FINANCIAL MANAGEMENT 3 credits
Prerequisite: MF 245. Preparation and presentation of food. Emphasis on preparation and presentation of food. Emphasis on preparation and presentation of food.

510 HISTORY OF FURNISHINGS AND INTERIORS 3 credits
Study of furnishings and interiors from antiquity through the eighteenth century, with emphasis on the social-cultural influences shaping their development.

515 HISTORY OF FURNISHINGS AND INTERIORS 3 credits
Study of furnishings and interiors from antiquity through the eighteenth century, with emphasis on the social-cultural influences shaping their development.

520 EXPERIMENTAL FOODS 3 credits

533 PROFESSIONAL IMAGE ANALYSIS 3 credits
Prerequisites: MF 310 and MF 315. Study of the psychological basis for social influences, interpersonal factors that affect the development, evaluation, and social-cultural influences shaping their development.

535 NUTRITION IN THE LIFE CYCLE 3 credits
Prerequisite: MF 310. Study of the psychological basis for social influences, interpersonal factors that affect the development, evaluation, and social-cultural influences shaping their development.

537 ADVANCED TEXTILES 3 credits
Prerequisite: MF 310. Study of the psychological basis for social influences, interpersonal factors that affect the development, evaluation, and social-cultural influences shaping their development.

537 TEXTILE AND APPAREL INDUSTRIES 3 credits
Prerequisite: MF 310. Study of the psychological basis for social influences, interpersonal factors that affect the development, evaluation, and social-cultural influences shaping their development.

541 INTERIOR TEXTILES AND PRODUCT ANALYSIS 3 credits
Prerequisite: MF 310. Study of the psychological basis for social influences, interpersonal factors that affect the development, evaluation, and social-cultural influences shaping their development.
587 INDIVIDUAL INVESTIGATION IN FAMILY DEVELOPMENT 1-3 credits
Prerequisite: permission of graduate adviser. Individual research and analysis in specific area of student's interest and design under direction of faculty adviser.

593 INDIVIDUAL INVESTIGATION IN CHILD DEVELOPMENT 1,3 credits
Prerequisite: permission of graduate adviser. Individual pursuit and analysis in specific area of student's interest and design under direction of faculty adviser.

609 MASTERS' THESIS 5 credits
Prerequisite: permission of adviser. Preparation of this is contingent on a selected research project in area of family or child development.

MUSIC 7500:

584 GRADUATE MUSIC THEORY REVIEW 2 credits
Prerequisite: Undergraduate music theory equivalent to four semesters. Review of basic music theory concepts. Coverage includes the chromatic harmonic vocabulary of the 18th, 19th, and 20th centuries.

587 GRADUATE MUSIC HISTORICAL REVIEW 2 credits
Prerequisite: Undergraduate music history equivalent to four semesters or music history of life-related study. Review of basic music history for graduate students. Coverage extends, at will, 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. Comprehensive musicoLOGY, aesthetics, psychology and physiology of music; aesthetics; theory of music; musical historical.

534 MUSIC SOFTWARE SURVEY AND USE 2 credits
Prerequisite: 32 & 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 as a program.

535 ADVANCED CONDUCTING: INSTRUMENTAL 2 credits
Practicum for both instrumental and vocal techniques and problems related to practice, rehearsing, and preparation of scores. Organization of ensembles; programming; conducting large instrumental ensembles. One hour lab required.

536 ADVANCED CONDUCTING: CHORAL 2 credits
Prerequisite: 38 or equivalent. Conductive techniques to the choral ensemble; including leadership, vowel direction, tonal development, stylistic accuracy and analysis. One hour lab required.

537 REPERTORY AND PEDAGOGY: ORGAN 3 credits
Prerequisite: Permission of instructor. Study of organ literature of all areas and styles, and methods of teaching organ, applying principles to literature.

538 REPERTORY AND PEDAGOGY: STRING INSTRUMENTS 3 credits
Prerequisite: Permission of instructor. Study of the bowed string instruments, their teaching and close relationship. Despite obvious difference in acoustical application of cellos and bass from viola and violin, methods of bowing, sound production and coloring are closely related.

541 GUITAR PEDAGOGY 2 credits
Prerequisite: permission of instructor. A systematic analysis of prevailing schools of guitar pedagogy, production psychology, method books and special problems in teaching addressed.

542 GUITAR ARRANGING 2 credits
Prerequisite: permission of instructor. Arranging analyses of selected examples, student make original solo guitar arrangements of works written for other solo instruments.

549 HISTORY AND LITERATURE OF THE GUITAR AND LUTE 2 credits
Prerequisite: 549A for junior. Study of guitar, historical and technological presentations, emphasis on visual and aural study of the instruments, their teaching and close relationship. Despite obvious difference in acoustical application of cellos and bass from viola and violin, methods of bowing, sound production and coloring are closely related.

550 WORKSHOP IN MUSIC 2 credits
Prerequisite: permission of instructor. Investigation of topics not offered in regular curricula. Graduate student must fulfill all additional requirements.

561 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 of great choral composition of nine centuries.

562 DEVELOPMENT OF ORCHESTRA 2 credits
Prerequisite: permission of instructor. Growth and development of orchesstra from 1600 to present. Includes detailed examination of stylistic and structural changes as well as performance practices.

563 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.

565 PEDAGOGY OF JAZZ IMPROVISATION 3 credits
A detailed study of the methods and materials as they relate to the teaching of jazz improvisation.

566 FOUNDATIONS AND PRINCIPLES OF MUSIC EDUCATION 3 credits
Prerequisite: permission of instructor. Study of basic philosophical, historical, sociological and psychological concepts among which public school music programs function.

567 PRACTICES AND TRENDS IN MUSIC EDUCATION 3 credits
Prerequisite: permission of instructor. Indebth exploration of innovative practices and trends in music education. Findings of research and practice related to prevailing situations in public/private school programs.

569 INSTRUCTIONAL PROGRAMMING IN MUSIC FOR THE MICROCOMPUTER 3 credits
Prerequisite: MUSIC 101. Instruction in programming languages for the microcomputer including BASIC, Pascal and Assembly. Programming will be directed towards music educational concepts.
MUSICAL ORGANIZATIONS 7510:

521 GUITAR CHAMBER MUSIC
- Credit
- Prerequisite: Open to all upper class instrumentalists and vocalists. Guitarists must have taken Guitar Ensemble, 750.105, Study, coaching, and performance of major works for guitar with other instruments or voice. Major conducted ensemble for guitar majors.

602 AKRON SYMPHONY CHORUS
- 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
- 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
- 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. oratorio, cantata, and oratorios.

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
- 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 performing the substantial repertoire for small orchestra. Open to a student of advanced ability.

614 KEYBOARD ENSEMBLE
- Invites three to five hours a week. Keyboard majors 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 MUSICI
- 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 rehearse and perform a selected body of music.

619 UNIVERSITY CHORAL UNION
- Membership by audition. Well-prepared soloists devoted to study and performance of choral master works. Registration for credit open to all students who are not vocal music majors.

620 CONCERT CHOIR
- Membership by audition. Highly select mixed choir. Performs classical literature from early 1500's to the present. 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.

627 MADRIGAL SINGERS
- 1 credit
- Membership by audition. Ensemble devoted to performance of vocal chamber music of the Renaissance. Presents madrigal and motets and on and off campus. Fall semester.

628 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.

629 CONCERT BAND
- 1 credit
- Membership by audition. Performs the finest in concert band literature available for concert bands today.

630 MARCHING BAND
- 1 credit
- This organization is noted for its high energy performances. University football games. Enrollment is open to all members of the University student body.

677 BLUE AND GOLD BRASS
- The official band for Akron home basketball games. Membership by audition.

682 UNIVERSITY BAND
- This ensemble is active during Spring Semester Only. This concert band is open to all members of the University Community.
Courses of Instruction

502 CORPARETE VIDEO DESIGN
Prerequisites: 201, 202. Contact analysis of production problems, design and writing of scripts for promotion, training, and news in corporate and health service settings.

503 CORPORATE VIDEO MANAGEMENT
Prerequisite: 493. Budgeting for individual productions and production facilities, scheduling, script breakdown, management of corporate and health service media settings.

504 AUDIO AND VIDEO EDITING
Prerequisites: 290. Theory and practice of editing audio and video for broadcast and corporate applications.

505 DIRECTING VIDEO PRODUCTIONS
Prerequisite: 280 and permission. Script analysis, casting, principles of directing, directing non-professional talent. Laboratory exercises.

506 THEORIES OF RHETORIC
Study of key figures in history of rhetorical theory, stressing relationships among theories of rhetoric, intellectual climates and social climates.

507 THE AMERICAN FILM INDUSTRY
History, current operation and possible futures of the American film industry. Business and industrial aspects of film considered in relation to technological and social change.

508 ADVANCED FILM PRODUCTION
Prerequisite: 280. Advanced study in film. Includes study of 35 mm, 16 mm, and Super-8 mm color and black and white, sound on film. Emphasis on American film and TV.

509 DOCUMENTARY FORM IN FILM AND TELEVISION
3 credits
Historical and critical study of documentary and nonfiction forms in film and television with an analysis of their roots in philosophy and radio. Emphasis on American film and TV.

510 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.

511 CORPORATE VIDEO PRACTICUM
2-6 credits
Prerequisite: permission. Practical application of writing, directing, management, recording, and editing skills in problems of crises, education and health services. Lab fees.

512 INTRODUCTION TO GRADUATE STUDY IN COMMUNICATION
6 credits
Introduction to the ideas and scholarly work that constitute the various research interests in the department.

513 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.

514 INTRODUCTION TO QUANTITATIVE RESEARCH IN COMMUNICATION
3 credits
Prerequisite: 280. 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.

515 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 teaching graduate assistants.

516 COMMUNICATION PEDAGOGY
3 credits
Familiarizes students with aspects of teaching communication and media courses at the college level.

517 AMERICAN MASS MEDIA SYSTEMS
3 credits
Study of dimensions of field of communication: information analysis, social interaction and semantic analysis.

518 THEORIES OF MASS COMMUNICATION
3 credits
A review of theories of mass media and studies exploring the effect of media.

519 CONTEMPORARY ISSUES IN BROADCASTING
3 credits
Study of issues important to the management of radio and television broadcasting station. Subscription to professional journal required.

520 CONTEMPORARY PUBLIC RELATIONS THEORY
3 credits
Study and practical application of public relations concepts, theories and skills relevant to public relations programs in businesses and nonprofit organizations.

521 Seminar: Advanced Production Design
3 credits
Prerequisites: 280, 493 or equivalent. Analysis of communication problems and the design of solutions mediated by film, video and photography. Emphasis on producing research and writing in various media formats. Design and production of a major project.

522 Seminar: Advanced Production Design II
3 credits
Prerequisite: 651. Conservation of projects in 651 and an opportunity for students to work in additional media.

523 Issues in Legal Regulation of the Media
3 credits
Structure of the regulatory system; the role and function of collective political discourse. Focus on various political methodologies for understanding social movements and case studies.

524 Study of radio station programming
3 credits
525 Study of communication media: television
3 credits

COMMUNICATION 7600:

534 THEORY OF GROUP PROCESSES
3 credits
Group communication theory and conference leadership as applied to individual projects and seminar reports.

535 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 influence events and reflected their times.

536 CORPORATE VIDEO DESIGN
3 credits
Prerequisites: 201, 202. Contact analysis of production problems, design and writing of scripts for promotion, training, and news in corporate and health service settings.

537 CORPORATE VIDEO MANAGEMENT
3 credits
Prerequisite: 493. Budgeting for individual productions and production facilities, scheduling, script breakdown, management of corporate and health service media settings.

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3 credits
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Prerequisite: 280 and permission. Script analysis, casting, principles of directing, directing non-professional talent. Laboratory exercises.

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3 credits
Prerequisite: 280. Advanced study in film. Includes study of 35 mm, 16 mm, and Super-8 mm color and black and white, sound on film. Emphasis on American film and TV.

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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.

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Introduction to the ideas and scholarly work that constitute the various research interests in the department.

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3 credits
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1 credit
Designed to train a graduate student in methods and materials of introductory speech course. Required of teaching graduate assistants.

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Study of issues important to the management of radio and television broadcasting station. Subscription to professional journal required.

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3 credits
Prerequisites: 280, 493 or equivalent. Analysis of communication problems and the design of solutions mediated by film, video and photography. Emphasis on producing research and writing in various media formats. Design and production of a major project.

556 Seminar: Advanced Production Design II
3 credits
Prerequisite: 651. Conservation of projects in 651 and an opportunity for students to work in additional media.

557 Issues in Legal Regulation of the Media
3 credits
Structure of the regulatory system; the role and function of collective political discourse. Focus on various political methodologies for understanding social movements and case studies.

558 Study of radio station programming
3 credits
559 Study of communication media: television
3 credits

564 THEORY OF GROUP PROCESSES
3 credits
Group communication theory and conference leadership as applied to individual projects and seminar reports.

565 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 influence events and reflected their times.
COMMUNICATIVE DISORDERS

7700:

530 ASPECTS OF NORMAL LANGUAGE DEVELOPMENT 3 credits
(Not open to communicative disorders majors) Introduction to instruction 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 2 credits
Overviews electronic and non-electronic augmentative communication systems, including candidates, terminology, environments, devices, symbol systems, vocabulary selection, and funding. Considers issues of assessment and intervention.

560 SPEECH-LANGUAGE AND HEARING DISORDERS IN THE PUBLIC SCHOOLS 2 credits
(Not open to communicative disorders majors) Nature, causes and treatment of speech, hearing and language disorders in school. Special reference to role of classroom teachers in identifying and referring students with suspected problems and in working with school clinicians.

561 ORGANIZATION AND ADMINISTRATION PUBLIC SCHOOL SPEECH-LANGUAGE PROGRAMS 2 credits
Prerequisites: Seniors or graduate standing. For clinicians who plan to work in public school systems. Covers program requirements and professional/moral issues imposed by FL 34-42.

563 COMMUNICATION DISORDERS: GERIATRIC POPULATION 2 credits
Introduces students to communicative disorders in an elderly population and current research, treatment approaches, and management of communicative disorders in elderly and neurologically delayed children.

565 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 neurologically delayed children.

590 WORKSHOP: COMMUNICATIVE DISORDERS 1-3 credits
May be repeated for a total of four credits. Prerequisite: Permission. Program investigation of particular phase of speech pathology and 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 public sectors. Philosophy and methodology of 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 COMMUNICATION DISORDERS I 3 credits
Introduction to experimental design in field of communication disorders.

612 RESEARCH METHODS IN COMMUNICATION DISORDERS II 2 credits
Prerequisite: 611. Advanced experimental methods; development of a research study.

619 COMMUNICATION DISORDERS: ADULT DYSARTHRIA AND APHASIA 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 disorders.

621 COMMUNICATION DISORDERS IN CLEFT PALATE 2 credits
Historical background, current theories and research related to etiology, diagnosis and treatment of cleft palate.

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 instructor. Background and current research related to normal voice 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 maximum of four credits. Prerequisite: Permission of instructor. Recent advances in differential diagnosis of speech and language disorders.

629 TOPICS: SPEECH PATHOLOGY AND AUDIOLoGY 2 credits
Prerequisite: Permission of instructor. Recent advances 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 COMMUNICATION DISORDERS: CLOSED HEAD INJURY 2 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 clinical experiences in assessment and feeding techniques.

633 SEMINAR IN LANGUAGE AND SPEECH OF THE HEARING IMPAIRED 2 credits

635 ADVANCED CLINICAL TESTING 4 credits
Theoretical basis for pure tone, speech tests, masking and acoustic impedance measurements. Review of current and critical literature relative to above tests.

640 SPECIAL TESTS/MEDICAL AUDIOLoGY 2 credits
Prerequisite: 629 or permission of instructor. Underlying psychoacoustic principles of administration and interpretation of site-of lesion tests. Relationship between otology and audiology. Application of clinical audiometry in medical environment.

641 AMPLIFICATION 3 credits
Prerequisite: 639 or permission of instructor. Components of amplification systems; methods of testing hearing aid performance.

642 PEDiATRIC AUDIOLoGY 2 credits
Prerequisite: 633 or permission of instructor. Emphasis on hearing loss in children, techniques for testing preschool and school-age children and other difficult-to-test clients.

643 INDUSTRIAL AUDIOLoGY 2 credits
Prerequisite: 633 or permission of instructor. Theoretical principles of noise measurement; eligibility for 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 CWRH. Fee and as current and potential areas of research.

646 EVOKEO POTENTIALS 2 credits
Prerequisite: Permission of instructor. A study of auditory, visual and somatosensory evoked potentials and their clinical applications in audiology and neurology.

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 ELECTROENCEPHALOGraphy 2 credits
Prerequisite: permission of instructor. Study of the anatomy and physiology of the vestibular system. Electrophysiological (ENG) recording procedures. ENG protocols and interpretation of ENG results.

650 ADVANCED CLINICAL PRACTICUM: DIFFERENT DIAGNOSES 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: V0ICE 1 credit
Prerequisite: 629 or permission. May be repeated for a maximum of six credits.) Supervised clinical practicum in treatment of voice disorders. Includes diagnosis/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 diagnosis/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 treatment of hearing disorders. Includes diagnosis/treatment 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 diagnosis/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 diagnosis/treatment procedures and preparation of reports.

660 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 diagnosis/treatment procedures and preparation of reports.

665 EXTERNSHIP: SPEECH PATHOLOGY AND AUDIOLoGY 4-2 credits
Prerequisite: Permission. May be repeated for a maximum of six credits.) Clinical practicum in a selected speech-language-hearing facility.

667 SPECIAL PROBLEMS: SPEECH PATHOLOGY AND OR AUDIOLOGY 1-2 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 1-6 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 intermediate methods for utilization of community organization and social planning as social work processes 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.
Courses of Instruction

510 MINORITY ISSUES IN SOCIAL WORK PRACTICE 3 credits
Prerequisite: 276 or permission of instructor. Must be taken prior to or concurrently with and one of the other practice courses 402, 403, 404. Racial, ethnic and cultural issues in social work practice related to theoretical perspectives, to various types of social problems, services 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 of 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 practice, settings, and issues in social work.

527 HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT I 3 credits
Prerequisite for 437, 476 or permission of instructor: 527 or 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 430, 476 or permission of instructor: 530 or permission of instructor. Emphasis on social work 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
Prerequisite for 440, 476 or permission of instructor: 540 or permission. Social work practice'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, 442 or permission of instructor for 541 or permission of instructor. Evaluation of social work intervention with individual, group, and community. Emphasizing and interpreting agency information for better practice, policy, and administrative decision.

545 SOCIAL POLICY ANALYSIS FOR SOCIAL WORKERS 3 credits
Prerequisite for 445 or permission of instructor: 545 or permission of instructor. Degree and policy description, analysis and construction of policy in social services to understanding for students of advanced standing in understanding consequences of social policies, and to establish goals for social policy development integrated into effective social work methodology.

556 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, de-elopment and provision of social services to meet needs of aging or 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, welfare, and alternative services.

552 SOCIAL WORK IN MENTAL HEALTH 3 credits
Prerequisite: 276 or permission of instructor. Issues, organization, development, and methodological principles of current professional social work practice in mental-health settings.

565 THE BLACK FAMILY 3 credits
Prerequisite: 276 or permission of instructor. Contemporary problems facing black families: major family relationships, single parent households, black teens and elderly, public policy, theoretical models, explaining development of the black family.

566 SOCIAL WORK IN PRACTICE SERVICES 3 credits
Prerequisite: 276 or permission of instructor. Policies, programs and practices in healthcare settings: short-term, intermediate and long-term, hospitals, outpatient services, emergency services, clinics, visiting nurse services, nursing homes, pediatric services, self-help organizations.

577 ADVANCED PRACTICE WITH INDIVIDUALS 3 credits
Prerequisite: 480 or permission of instructor. Undergraduate social work degree or permission of instructor. Direct and indirect strategies and techniques of intervention to aid individuals in improving psychosocial functioning.

588 ADULT DAY CARE 3 credits
Prerequisite: 437, 476 or permission of instructor: 588 or permission of instructor. Planning, development, implementing, evaluating, and delivery of adult day care services.

595 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.

596 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/administration relationship as it affects the organizational goal-setting and program implementation problems.

597 LAW FOR SOCIAL WORKERS 3 credits
Prerequisite: 276 or permission of instructor. Basic terminology, theories, principles, organization, and procedures of the law will be explored along with the relationships between social work and law and comparisons of the theoretical bases of the two professions.

598 SUBSTANCE ABUSE AND SOCIAL WORK PRACTICE 3 credits
Prerequisite: 276 or permission of instructor. An exploration of the differences between social work and social work practice with persons in addiction and recovery, and policy, settings, innovative interventions and trends in delivery systems in relation to selection, evaluation, and practice.

599 SPECIAL TOPICS IN SOCIAL WORK AND SOCIAL WELFARE 3 credits
Prerequisite: permission of instructor. Application and integration of social work and social welfare policy and theory and policy, settings, innovative interventions and trends in delivery systems in relation to selection, evaluation, and practice.

610 SOCIAL WORK PRACTICE 1 credits
May be repeated for a total of six credits. Prerequisite: permission of instructor. Group investigation of a particular phase of social work or social welfare not covered by other courses in social work with the permission of instructor.

611 INVESTIGATIONS IN SOCIAL WORK SOCIAL WELFARE 1 credits
Prerequisites: permission and prearrangement with instructor. Individual readings, research project, or area of interest in social welfare theory and social work practice under guidance of social work faculty member. Preparation of report paper appropriate to nature of topic. For social work major.

604 SOCIAL WORK PRACTICE WITH SMALL SYSTEMS 3 credits
Prerequisite: Graduate student status and permission of instructor. Provides the basic knowledge and skills necessary for beginning social work practice with small client systems.

606 SOCIAL WORK PRACTICE WITH LARGE SYSTEMS 3 credits
Prerequisite: 640 or permission of instructor. Provides the basic knowledge, skills, and strategies of social work practice with task groups, organizations, and communities.

608 FOUNDATION FIELD PRACTICUM 3 credits
Prerequisite: 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.

611 DYNAMICS OF RACISM AND DISCRIMINATION 3 credits
Prerequisite: Graduate status or permission of instructor. Provides knowledge of explaining and understanding the factors leading to and sustaining racism, sexism, homophobia, and the like, at macro and micro levels.

612 FOUNDATIONS OF SOCIAL WORKPRACTICE 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.

613 FOUNDATIONS OF SOCIAL WORKPRACTICE II 3 credits
Prerequisite: Graduate status or permission of instructor. Students with an understanding of qualitative and quantitative methodologies and the use of descriptive and inferential statistics in analysis.

613 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.

614 HUMAN BEHAVIOR AND SOCIAL ENVIRONMENT: LARGE SYSTEMS 3 credits
Prerequisite: 631 or permission of instructor. This course focuses on explaining the human behavior of major social systems inclusive of familiar and informal organizations, communities, and institutions.

615 ADVANCED STANDING INTERGRATIVE SEMINAR 3 credits
Prerequisite: Graduate student or permission of instructor. This seminar provides a comprehensive view of social work practice with an emphasis on values, foundation knowledge and skills, and evaluation of professional interventions.

616 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 trained in related fields and for social workers.

704 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.

705 ADVANCED PRACTICE WITH SMALL SYSTEMS II 3 credits
Prerequisite: 640 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.

708 ADVANCED FIELD PRACTICUM 6 credits
Prerequisite: Graduate status, currently enrolled in or completed second year coursework. A semester course consisting of a 600 clock hour, supervised internship in a social service agency. Based on the student's concentration and specialization.

708 SOCIAL WORKPRACTICE 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.

707 SOCIAL WORKPRACTICE II 3 credits
Prerequisite: 640 or permission of instructor. This course prepares students with the beginning skills to engage in social policy/professional policy.

710 IMPULSION OF DIVERSITY FOR SOCIAL WORK PRACTICE 3 credits
Prerequisite: Second level graduate status or permission of instructor. Provides content on the origins and the unique strengths of diverse groups and the implications for social work practice at the community level.

716 SOCIAL WORK PRACTICE WITH GAYS AND LESBIANS 3 credits
Prerequisite: Second level graduate status or permission of instructor. A survey of gay and lesbian culture and lifestyles, discrimination based on sexual orientation, and intermediate theories and strategies for intervention with gays and lesbians.

717 PSYCHOPATHOLOGY AND SOCIAL WORK 3 credits
Prerequisite: Second level graduate or permission of instructor. An examination of the symptoms, theories, and psychological aspects of mental illness, and the role of the social worker in the treatment of mental disorders.

701 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.

715 SUPERVISION AND STAFF DEVELOPMENT 3 credits
Prerequisite: Second level graduate status or permission of instructor. An examination of purpose, functions, and theories of supervision; the impact of cultural, ethnic and racial differences in supervision; staff development, and problems encountered.

717 SOCIAL WORK ADMINISTRATION 3 credits
Prerequisite: Second level graduate status 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.

722 STRATEGIES OF COMMUNITY ORGANIZATION 3 credits
Prerequisite: Second level graduate student or permission of instructor. Emphasizes the history of development and application of community strategies used to identify community problems, and how to organize and empower diverse community groups.

724 INTRODUCTION TO COMMUNITY ORGANIZATION AND PLANNING 3 credits
Prerequisite: Second level graduate status or permission of instructor. A descriptive and critical analysis of various theoretical concepts and strategic ideas that are used as a framework for Community Organization (CO) practice.

725 COMMUNITY, ECONOMIC SYSTEMS AND SOCIAL POLICY ANALYSIS 3 credits
Prerequisite: Second level graduate student or permission of instructor. This course provides a basis for understanding economic systems and analyzing the political framework at federal, state, and local levels and their impact on communities.

726 PROGRAM EVALUATION 3 credits
Prerequisite: Second level graduate status 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.
THEATER

THEATER ORGANIZATIONS 7810:

651 ADVANCED PROBLEMS IN DIRECTING 3 credits
Prerequisite: 641 or permission of instructor. A continuation of 641. Further indepth investigation of styles and techniques, interpretative concepts, and coaching of actors will continue for a total of 12 credits.

652 SEMINAR IN COMEDY DELL' ART 3 credits
The origins and history, scenario, actor and groups, and staging techniques of the Commedia dell'Arte.

653 DRAMATIC THEORY AND CRITICISM 2 credits
An exploration of the major dramatic theorists and critics from Classical Greece to the present, with an emphasis on the 20th Century.

654 HISTORY OF TECHNICAL PRODUCTION 3 credits
Theater history from the Greeks to the present with emphasis on historical lighting design and the changing roles of theater design.

655 HISTORY AND THEORY OF STAGE LIGHTING 3 credits
Historical survey of evolution of stage lighting culminating in understanding of modern lighting design and their practical application. Term paper or major project required.

656 ADVANCED TECHNICAL THEATER 2 credits
Prerequisites: 641 or permission of instructor. Is designed to prepare the student to be a professional stage lighting designer.

657 SEMINAR IN STAGE COSTUME DESIGN 3 credits
Prerequisite: advanced costume design course or permission of instructor. Study of special problems—costume design for musical or opera theater. Research of specific period costume patterns and portfolio projects, and research of noted designers.

658 SEMINAR IN DIRECTING 3 credits
Prerequisite: 641 or permission of instructor. A study of the practice of directing for the stage. Emphasis on planning and evaluation, and doing preventive work. Term paper or project required.

660 AUDIENCE DEVELOPMENT 3 credits
Developing audiences for the Arts through Arts marketing techniques, including group蜷t and box ticket campaigns, promotional strategies, media/public relations, market research, and telemarketing.

661 PRINCIPLES OF ARTS ADMINISTRATION 3 credits
Prerequisite: 641 or permission of instructor. A study of the administrative aspects of the fine arts, including financial management, marketing, personnel, and production of nonprofit theater. Group study or group projects investigating specific phases of fine arts administration.

662 FUND RAIDING AND GRANTSMANSHIP IN THE ARTS 3 credits
Prerequisite: permission of instructor. A study of fundraising and grantsmanship for the fine arts. Research of specific grant opportunities for nonprofit organizations.

663 LEGAL ASPECTS OF ARTS ADMINISTRATION 3 credits
Prerequisite: permission of instructor. A study of the legal ramifications of nonprofit arts organizations, contracts, copyrightlaw, insurance, labor, and public policy.

664 MASTER'S 1-6 credits
Prerequisite: permission of instructor. This is a study of the fine arts, including financial management, personnel, and production of nonprofit theater. Group study or group projects investigating specific phases of fine arts administration.

THEATER ORGANIZATIONS 7810:

651 ADVANCED PROBLEMS IN DIRECTING 3 credits
Prerequisite: 641 or permission of instructor. A continuation of 641. Further indepth investigation of styles and techniques, interpretative concepts, and coaching of actors will continue for a total of 12 credits.

652 SEMINAR IN COMEDY DELL' ART 3 credits
The origins and history, scenario, actor and groups, and staging techniques of the Commedia dell'Arte.

653 DRAMATIC THEORY AND CRITICISM 2 credits
An exploration of the major dramatic theorists and critics from Classical Greece to the present, with an emphasis on the 20th Century.

654 HISTORY OF TECHNICAL PRODUCTION 3 credits
Theater history from the Greeks to the present with emphasis on physical theater, conventions, and theatrical architecture of each period.

655 HISTORY AND THEORY OF STAGE LIGHTING 3 credits
Historical survey of evolution of stage lighting culminating in understanding of modern lighting design and their practical application. Term paper or major project required.

656 ADVANCED TECHNICAL THEATER 2 credits
Prerequisites: 641 or permission of instructor. Is designed to prepare the student to be a professional stage lighting designer.

657 SEMINAR IN STAGE COSTUME DESIGN 3 credits
Prerequisite: advanced costume design course or permission of instructor. Study of special problems—costume design for musical or opera theater. Research of specific period costume patterns and portfolio projects, and research of noted designers.

658 SEMINAR IN DIRECTING 3 credits
Prerequisite: 641 or permission of instructor. A study of the practice of directing for the stage. Emphasis on planning and evaluation, and doing preventive work. Term paper or project required.

660 AUDIENCE DEVELOPMENT 3 credits
Developing audiences for the Arts through Arts marketing techniques, including group蜷t and box ticket campaigns, promotional strategies, media/public relations, market research, and telemarketing.

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Prerequisite: permission of instructor. A study of the legal ramifications of nonprofit arts organizations, contracts, copyrightlaw, insurance, labor, and public policy.

664 MASTER'S 1-6 credits
Prerequisite: permission of instructor. This is a study of the fine arts, including financial management, personnel, and production of nonprofit theater. Group study or group projects investigating specific phases of fine arts administration.
Courses of Instruction

NURSING 8200:

501. INTERNATIONAL NURSING 3 credits
Prerequisite: Admission to the M.S.N. program. A comparison of nursing in the Norwegian-American health care systems will include educational, ethical, legal, political, demographic, and geographic influences on health care.

509. SPECIAL TOPICS: NURSING 1-6 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.

592. WORKSHOPS 1-4 credits
(May be repeated as new topics are presented. Selected topics in nursing. May be used to meet nursing major graduate requirements at the discretion of the college.

596. SPECIAL READINGS 1-6 credits
Prerequisite: permission of student's adviser or dean. Special readings in an area of concentration may be taken to satisfy electove credit. Special readings may not be used to satisfy requirements of the major.

603. THEORETICAL BASIS FOR NURSING 3 credits
Prerequisite: Admission to Graduate Program. Overview of current nursing science. Evaluation and critique of key 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 populations. Examination of federal, state, and local policies affecting this population.

608. PATHOPHYSIOLOGICAL CONCEPTS OF NURSING CARE 3 credits
Prerequisite: Consent of the M.S.N. Program. Induction study of pathophysiological and related treatment modalities. The course focuses on specific nursing interventions related to these pathophysiological abnormalities.

613. NURSING INQUIRY I 3 credits
Prerequisite: Admission to Graduate Program. Concepts and ethical issues relating to nursing inquiry are examined, emphasizing the phases of the research process. Students participate in clinical analysis of nursing research.

615. ADVANCED CLINICAL PRACTICE SEMINAR 2 credits
Prerequisite/Co-require: 627 or 667 or 677. Discusses issues, concepts, and theories relevant to the development of advanced clinical practice roles.

619. NURSING INQUIRY II 4 credits
Prerequisite: 619 and permission of instructor. Emphasis on development of competencies and research skills. Research projects will involve a full pilot study, or be participation in faculty research projects.

621. GERONTOLOGICAL NURSING 3 credits
Prerequisite: Co-requisite: 603, 3100-670. Physiological, psychological, and sociological theories of aging are analyzed in relation to nursing practice and nursing research. Nursing interventions focus on preageing and maintaining function.

625. GERONTOLOGICAL NURSING II 4 credits
Prerequisite: Co-requisite: 613. Major nursing care problems and psychological disabilities are analyzed. Clinical focus is on development of skills to maintain or restore function.

627. GERONTOLOGICAL NURSING III 4 credits
Prerequisite: 625. Emphasis on long-term care and rehabilitation in institutions, and home and community settings. Clinical experiences focus on nursing responsibilities and interventions with older populations.

629. PRACTICUM: GERONTOLOGICAL NURSING 3 credits
Prerequisite: 627. Co-requisite: 613. Integration of nursing knowledge and skills with 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
Prerequisite: 603, 3100-670, 6200-601. Examines organizational behavior theories/principles related to the planning, implementation, and assessment of organizational structure in nursing settings.

638. PRACTICUM: NURSING ADMINISTRATION I 5 credits
Prerequisite: 630 and 632 and 635. Leadership and management theories are utilized to guide study of the role of the nurse administrator.

639. PRACTICUM: NURSING ADMINISTRATION II 5 credits
Prerequisite: 638. Leadership and management theories are utilized to guide practice of the role of the nurse administrator.

640. SCIENTIFIC COMPONENTS OF NURSE ANESTHESIA 3 credits
Prerequisite: Acceptance into Nurse Anesthesia Co-requisite: 603. The course presents content dealing with the chemical and physical components of anesthesia agents.

641. PHARMACOLOGY FOR NURSE ANESTHESIA 3 credits
Prerequisite: Consent. The study of xenobiotic induction agents, inhaled anesthetics and related anesthetics commonly used in the administration of general anesthesia. Includes use of muscle relaxants.

642. PRINCIPLES OF NURSE ANESTHESIA 4 credits
Prerequisite: 640. This course focuses on the acquisition of basic skills related to nursing anesthesiology care and administration of anesthesia agents, with a focus on equipoise.
POLYMER ENGINEERING

681 STRUCTURAL CHARACTERIZATION OF POLYMERS WITH ELECTROMAGNETIC RESONANCE 2 credits

682 RHEOLOGY AND POLYMER PROCESSING 2 credits
Experimental methods of determination of rheological properties of polymer melts, solutions, melts, films, fiber, fiber processing methods. Structure development in processing.

682 ANALYSIS AND DESIGN OF POLYMER PROCESSING OPERATIONS 3 credits
Prerequisite: 682. Mathematical modeling and engineering design analysis of polymer processing operations including extruder screws, injection molding, shear stress relaxation, film formation.

683 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, strain behavior emphasis on experimental methods.

684 MECHANICAL STRENGTH OF POLYMER SOLIDS 2 credits
Extended chain crystal and theoretical strength of crystalline polymers, impact and high speed fatigue and long term testing, environmental stress testing, statistical failure of units, reinforcement and impact modification of thermoplastics, reinforcement of thermosets, reinforcement of elastomers.

685 POLYMER MATERIALS ENGINEERING SCIENCE 2 credits
Physico-chemical properties of amorphous and crystalline polymers. Glass transitions, crystallization, molecular orientation and morphology of commercial polymeric materials, fabricated products and composite materials.

686 ENGINEERING ASPECTS OF POLYMER COLLOIDS 2 credits
Thermodynamic properties of polymer colloids, gelation, gelation, rheology of polymer solutions, gels, suspensions and emulsions, phase separation, applications to paints and plastics.

687 INTRODUCTION TO POLYMER ENGINEERING 2 credits
Basic concepts of polymer engineering taught in lecture-laboratory format intended for orientation of new graduate students.

689 POLYMER ENGINEERING LABORATORY 2 credits
Laboratory experiments in the rheological characterization of polymer melts fabrication of engineering products, strategic investigation of polymeric parts.

690 POLYMERIZATION REACTOR ENGINEERING 2 credits
Polymers. Kinetics, chemical reactor design, comparison of polymerization batch and continuous stirred tank reactors, flow patterns along agitators, tubular reactors, reactor stability.

699 MASTER'S THESIS 3 credits (May be repeated) Supervised original research in specific area of polymer engineering.

700 ADVANCED ELECTROMAGNETIC AND OPTICAL PROPERTIES AND INVESTIGATIONS OF POLYMERS 2 credits
Maxwell's equations with applications to electromechanical, birefringence and dichroism and representation of orientation, optical instruments, piezoelectricity, scattering and diffusion of x-rays and light. Micromechanical applications.

702 RHEOLOGICAL AND PHYSICAL PROPERTIES OF POLYMERS 2 credits
Applications of rheological methods as means of determining stress fields in polymer glasses, and fluids during deformation, rheo-optical properties of polymers in glassy, rubbery, fluid state. Theory of the dynamic stress-optical effect and its application to mechanical relaxations of amorphous and semi-crystalline polymers, and recent experimental results.

703 RADIATION SCATTERING AND DIFFRACTION BY POLYMERIC MATERIALS 2 credits
Principles of scattering and diffraction theory as applied to polymer crystals, glasses and multi-phase systems. Wide angle and small angle x-rays, light and neutron scattering, analysis and determination of crystal structures, mathematical description of orientation by special distributions of polymer and determination of orientation by x-ray and other methods.

705 NON-NEWTONIAN FLOW 2 credits

720 RHEOLOGY AND PROCESSING OF ELASTOMERS 2 credits
Prerequisite: permission of instructor. Modelling of processing operations including extrusion molding, fiber and film processing, computer-aided design.

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.

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 ADVANCED POLYMER RHEOLOGY 2 credits
Prerequisite: 622 or equivalent. Second level course in non-linear constitutive equations for viscoelastic, visco-plastic, visco-elastic-plastic materials. Utility and applicability to polymer processing problems.

731 STRESS ANALYSIS OF POLYMERS AND COMPOSITES 2 credits
Prerequisite: 695. The design of rubber bearings and sandwich components with demonstration of finite element methods. Classical plates and shells theories with applications to composite structures.

741 PHASE TRANSFORMATIONS IN POLYMER MATERIALS 2 credits
Prerequisite: permission of instructor. Thermodynamics, nucleation and kinetics of growth of new phases, spiral decomposition and related mechanisms, crystallization, epitaxial crystallization, stress induced crystallization.

745 POLYMER BLENDS AND ALLOYS 2 credits
Thermodynamics of miscibility and morphology of polymer structures, compatibility, blending procedures, mechanical properties, structure-property relationships.

771 BLOW MOLDING AND THERMOFORMING 2 credits
Prerequisite: permission of instructor. General blow forming and mold forming concepts. Material structure-property relationships. Cooling and trimming to fit.

ADVANCED TOPICS IN POLYMER ENGINEERING 3 credits
May be repeated. Prerequisite: permission of instructor. Advanced special topics intended for Ph.D. students in polymer engineering.

601 POLYMER CONCEPTS 2 credits
Prerequisite: 601 or 602 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.

602 INDUSTRIAL POLYMER SCIENCE AND TECHNOLOGY 2 credits
Prerequisite: 601 or 602 or permission. Characterization of polymeric materials, the Boltzmann superposition principle and fracture. Experimental techniques involving stress-strain behavior, stress relaxation, creep, forced and free vibrations discussed.

603 POLYMER STRUCTURE AND PHYSICAL PROPERTIES OF POLYMERS I 3 credits
Prerequisite: 3101 or 3102 or permission. Interdisciplinary course involving the principles of chemistry and physics as applied to polymer structure and chemical composition of macromolecules and their physical properties.

604 POLYMER STRUCTURE AND PHYSICAL PROPERTIES OF POLYMERS II 2 credits
Prerequisite: 4110. Characterization of polymeric materials, the Boltzmann superposition principle and fracture. Experimental techniques involving stress-strain behavior, stress relaxation, creep, forced and free vibrations discussed.

605 POLYMER STRUCTURE AND PHYSICAL PROPERTIES OF POLYMERS III 3 credits
Prerequisite: 4125. Deformation of bonded rubber units, the configuration principle, time-dependent failure, mechanical properties of polymeric foams and design considerations discussed.

606 WORKSHOP IN POLYMER SCIENCE 1-3 credits (May be repeated with permission) Group studies on selected topics involving polymer science. May not be used to meet undergraduate or graduate major requirements in polymer science. May be used for elective credit only.

607 POLYMER DESIGN 2 credits
Prerequisite: 601 or 602 or permission. Design of rubber bearings and sandwich components with demonstration of finite element methods. Classical plates and shells theories with applications to composite structures.

608 SPECIAL PROJECTS IN POLYMER SCIENCE 1-3 credits
Prerequisite: permission. Research projects of limited nature assigned to students entering polymer science program. Intended to familiarize student with practical problems and techniques in this field.

609 POLYMER CHEMISTRY LABORATORY 2 credits
Prerequisite: 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 reactions.

607 POLYMER SCIENCE SEMINAR I AND II 2 credits
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: 4100 or permission. Survey course designed to broaden the background of the graduate student in polymer science and physics of polymers.

613 POLYMER SCIENCE LABORATORY 3 credits
Prerequisites: 610 or 612. Laboratory experiments in synthesis, characterization, physical properties and processing and testing of polymers.

614 LABORATORY COMPUTER APPLICATIONS IN POLYMER SCIENCE 3 credits
Prerequisites: Basic knowledge of computer programming and permission of instructor. Use of computer in polymer science research and data analysis, data analysis, and interpretation of polymers. Preparatory and analysis of data.

615 PHYSICAL PROPERTIES OF POLYMERS 2 credits
Prerequisite: permission of instructor. Thermodynamics of structural, mechanical and molecular basis of rubber elastic behavior, time-dependent mechanical properties of polymeric materials, melt-flow and flaw-growth, the microstructure of crystalline polymeric materials, failure of polymers.
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<td>PHYSICAL PROPERTIES OF POLYMERS II</td>
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<td>649</td>
<td>SYNTHESIS AND TECHNOLOGY OF ELASTOMERS</td>
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<td>675</td>
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<td>899</td>
<td>DOCTORAL DISSERTATION</td>
<td>1-4</td>
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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.

Prerequisites: 3510:313 and 3510:314 or permission of instructor. Presentation of statistical description of polymer molecular properties including chain polymerization and degradation, characterization of conformation, molecular weights, local structure, crystal structures and ordering.

Prerequisite: 674 or permission. Study of the theories and experiments concerning polymer solutions, polymer phase equilibria, and polymeric phase transitions and dilute solution steady-state transport.

Prerequisite: 674 or permission. Laboratory analysis of polymers by fractionation, osmetry, swelling, x-ray diffraction, microscopy, thermal analysis, spectroscopy and chromatography.

Prerequisite: permission. Study of process engineering in polymer conversion industry, emphasizing analytical treatments of heat transfer, mass flow, mixing, shaping and molding of polymeric materials.

Prerequisites: 6000.337 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.

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.

Prerequisite: 702 or permission of instructor. Rubber industry; rubber compounding and processing, vulcanization methods, physical testing, plastics preparation and compounding, manufacturing processes. Lecture/laboratory.

Prerequisite: 3510:463/563 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.

Prerequisite: 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.

Prerequisites: either 3510:314, 3510:315, 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.

Prerequisite: 708 or permission. Continuation of topics in 706 including experimental techniques used in elucidation of chain structure.

Prerequisite: permission. Topical current interest in polymer science, encompassing chemistry, physics or technological aspects of macromolecular substances, including laboratory work where applicable.

Prerequisite: permission. Topics of current interest in polymer science, encompassing chemistry, physics or engineering aspects of macromolecular substances.

Prerequisite or corequisite: 708 or permission of instructor. Designed to apply principles discussed in 708, to laboratory determination of polymer structure.

Open to properly qualified students accepted as candidates for Doctor of Philosophy in Polymer Science depending on the availability of staff and facilities.
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 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 resolved at that level or if 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 be sent as 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 the 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 selected by the Senior Vice President and Provost 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. From the complainant's department - a graduate student not directly involved, selected jointly by the Department Head and the President of the Graduate Student Government. If the grievance is filed against the Department Head, the Academic Dean shall substitute for the Department Head.
   b. From the complainant's department - a faculty member not directly involved, selected jointly by the Department Head and the President of the Graduate Student Government. If the grievance is filed against the Department Head, the Academic Dean shall substitute for the Department Head.
   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, or 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 occurs, 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 act on each case on an individual basis and his/her decision shall be considered final.

Approved by: Student Policy Committee, 3/29/93
Approved by: Graduate Council, 3/29/93
Approved by: Graduate Faculty, 4/2/93
Approved by: Executive Committee, 3/12/93
Approved by: Board of Trustees, 6/2/93
Intellectual Property Rights and Obligations

During your graduate study at The University of Akron and your professional career thereafter, you are expected to understand and adhere to the principles of intellectual property matters: copyrights, patents, and proprietary information. 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.

Copyright

Copyright, by law, is automatically owned by the author 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 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.

Patents

All discoveries and inventions in any way related to your research work at 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.

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.

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 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 re-evaluation by patent counsel shall only occur with the prior knowledge of your faculty advisor, Department Chair and Dean.
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 _______________________
Board of Trustees

May 1994

PEGGY GORDON ELLIOTT, Ph.D. (Term expires 1998)
CARYL TEA. MALLO, Ed.D. (Term expires 1997)
JOSEPH M. WALTON, J.D. (Term expires 1995)

Administration

Peggy Gordon Elliott, President of the University, Ed.D.
David L. Jameson, Senior Vice President and Provost, J.D.
Carolyn Hunt, Building, Akron, Ohio 44325 (Term expires 1999).

Deans

Randy Moore, Dean of the College of Arts and Sciences, Ph.D.
William E. Kungel, Dean of the College of Education, Ed.D.
James Innan, Dean of the College of Business Administration, LL.M.
Linda L. Moore, Dean of the College of Fine and Applied Arts, Ph.D.
V. Ruth Gray, Dean of the College of Nursing, Ed.D.
Magnus V. Hunt, Jr., Dean of the School of Law, LL.B.

Graduate Council

August 1994

Charles M. DyE, Ph.D., Interim Dean of the Graduate School, Chair

Term expires August 31, 1995

Jon M. Hayes, Ph.D., College of Business Administration
Monte E. Turner, Ph.D., College of Arts and Sciences: Natural Sciences — College of Fine and Applied Arts
Ralph K. Darr, Ph.D., College of Education
Susan I. Hardin, Ph.D., College of Arts and Sciences: Social Sciences — President, Graduate Student Government

Term expires August 31, 1996

Diane C. Reep, Ph.D., College of Arts and Sciences: Humanities
Paul Kudrall, Ph.D., College of Business Administration
Michael C. McTague, Ed.D., College of Education
Karen Reed, Ph.D., College of Nursing

Term expires August 31, 1997

Ted Allen Conway, Ph.D., College of Engineering
Gary R. Hamed, Ph.D., College of Polymer Science and Polymer Engineering
James M. Lynn, Ph.D., College of Fine and Applied Arts — College of Arts and Sciences: Social Sciences

Graduate Faculty*

September 1994

PEGGY GORDON ELLIOTT, President of the University, Professor of Education (August 1962) B.A., Transylvania College; M.S., Northwestern University; Ed.D., Indiana University, 1975.

ABDULAH ABOUZAMAN, Associate Professor of Mathematical Sciences (1988) B.S., University of Dayton; M.S. Wright State University; Ph.D., Illinois Institute of Technology, 1986.

Eve M. Adams, Counseling Psychologist: Adjunct Assistant Professor of Psychology (August 1988) B.A., Ohio Wesleyan University; M.A., Ph.D., The Ohio State University, 1988.


Carolyn A. Agranese, Associate Professor of Home Economics (1978) B.S., Southern Illinois University at Carbondale; M.S., The Ohio State University, 1969.

K. Ray Alderman, Professor of Economics (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 (1979) B.M., The Ohio State University; M.M., University of Louisville, 1974.

Deane A. Alley, Assistant Professor of Education (1989) B.S., Bat State University; Ed.D., Indiana University, 1991.


William M. Arbuckle, Associate Professor of Civil Engineering: Acting Department Chair of Civil Engineering (1986) B.S.C.E., University of North Carolina; M.S.E., Ph.D., University of North Carolina, 1975.


Kenneth E. Appere, Professor of Management (1986) B.A., M.A., Western Michigan University; Ph.D., University of Georgia, 1982.

James F. Austin, Associate Professor of Education: Coordinator of School Psychology (1981) B.A., M.A., Ph.D., Case Western Reserve University, 1971.

Roger J. Bain, Professor of Geology: Department Chair of Geology (1971) B.S., M.S., University of Wisconsin; B.S., Brigham Young University, 1968.

J. Wayne Baker, Professor of History: General Studies Course Director: Western Culture Traditions (1969) B.A., Western Baptist College; B.D., Talbot Theological Seminary; B.A., Pippin College, M.A., Ph.D., University of Iowa, 1970.

Phil R. Baldwin, Assistant Professor of Physics: Assistant Professor of Chemistry: Assistant Professor of Mathematical Sciences (August 1980) B.A., Princeton University; Ph.D., University of Illinois at Urbana, 1982.

Danny L. Baldouf, Assistant Professor of Urban Studies: and Public Administration (1990) B.A., Kent State University; M.S., Honors College, 1990.


Skelley O. Baranowski, Associate Professor of History (1989) B.A., Wells College; M.A., Ph.D., Princeton University, 1986.

Gerald V. Barrett, Professor of Psychology: Department Chair of Psychology (1973) B.A., Western University; M.S., Ph.D., Case Western Reserve University; J.D., The University of Akron, 1965.

Owen Basu, Assistant Professor of Accounting (1989) B.Com., M.S., University of Bombay, Ph.D., Pennsylvania State University, 1982.

Celal Bakir, Professor of Mechanical Engineering (February 1969) B.S., M.S., The Technical University of Istanbul; Ph.D., The University of Leicester, 1976.

Joan E. Baumgardner, Assistant Professor of Nursing (1978) B.S.N., M.S.N., The Ohio State University, 1985.

Elizabeth K. Beach, Associate Professor of Nursing (1988) B.S.N., University of Wisconsin; M.P.H., Ph.D., University of Michigan, 1978.

John D. Bee, Professor of Communication: Director of the School of Communication: General Studies Course Director: Speech (1996) B.S., Ohio University, M.A., Ph.D., University of Wisconsin at Madison, 1972.


Roderick R. Bendigton, Director of University Galleries (February 1962) B.A., Allegheny College; M.A., Kent State University, 1982.

David S. Bernstein, Professor of Music (1972) B.M., M.M., Florida State University; D.M., Indiana University at Bloomington, 1974.

Virginia M. Beringer, Cogeh (Assistant Professor of Biophysics (1975) B.A., The University of Akron; M.S., Kent State University, 1982.

William M. Beyers, Acting Associate Vice President for Administrative Support Services: Professor of Mathematical Sciences (1967) B.S., The University of Akron; M.S., Ph.D., Virginia Polytechnic Institute, 1970.

Clifford G. Billions, Professor of Music (1978) B.M., Oklahoma Baptist University; M.M., Convolve College, 1971.

Weslaw B. Biniaedi, Associate Professor of Civil Engineering (1988) M.S., Warsaw Technical University; M.S.M.E. Ph.D., Delft University, 1988.


Jean L. Bliss, Professor of Communicative Disorders: Director of the Speech and Hearing Clinic (January 1970) B.A., Ohio University; M.A., Kent State University, Ed.D., The University of Akron, 1986.

*These terms are included as starting the beginning of service at The University of Akron unless otherwise stated. Service began in the month of September.
Presidents

Buchtel College

E. L. Rixford*, 1878-1880, D.D.
Crello Cone*, 1880-1896, D.D.
Charles M. Knight*, 1896-1897, D.Sc. (ad interim)
Ira A. Priest*, 1897-1901, D.D.
A. B. Church*, 1901-1902, D.D., Litt. D.
Parke R. Kibbe*, 1903, Ph.D., Litt. D.

The University of Akron

Parke R. Kibbe*, 1912-1925, Ph.D., Litt. D.
George F. Zook*, 1925-1933, Ph.D., Litt. D.
Hezzilton E. Simmons*, 1933-1951, M.S., D.Sc., Litt. D.

Deans of the Colleges of The University of Akron

Buchtel College of Arts and Sciences

Charles B. Bulger*, 1938-1948, Ph.D., Litt. D.
Ernest H. Cherrington, Jr., 1948-1960, Ph.D.
Thomas Summer, 1960-1962, Ph.D.
George W. Knepper, 1962-1967, Ph.D.
Don A. Kestler, 1967-1969, Ph.D.
Robert A. Oetzjen, 1970-1977, Ph.D.
Claibourne E. Griffin, 1977-1983, Ph.D.
Randy Moore, 1983, Ph.D.

College of Engineering

R. D. Landon, 1948-1953, C.E., M.S.
W. M. Petry*, 1953-1964, M.S. M.E. (sacting)

College of Education

Michael J. Raza*, 1964-1970, Ph.D.
Coleman M. Major, 1970-1979, Ph.D.
Joseph Edminster, 1986-1986, J.D. (acting)
Louis A. Hill, Jr., 1986-1989, Ph.D.
Glenn A. Atwood, 1989-1989, Ph.D. (acting)
Nicholas S. Sylvester, 1989-1994, Ph.D.

College of Education

W. J. Bankes*, 1921-1929, M.A.
Howard R. Evans*, 1933-1932, Ph.D.
Hjalmer W. Distad*, 1942-1944, Ph.D. (acting)
Howard R. Evans*, 1944-1958, Ph.D.
Chester T. McNeely, 1959-1966, Ph.D., LL.D.
H. Kenneth Barker, 1966-1969, Ph.D.
Constance Coomer, 1966-1968, Ed.D.

College of Business Administration

Warren W. Light, 1953-1962, Ph.D.
Richard C. Redenbach, 1962-1967, Ph.D.
Wilbur Earl Benson*, 1968-1970, Ph.D.
James W. Dunlap, 1970-1976, Ph.D.
Russell J. Peteren, 1969-1994, Ph.D.

School of Law

Stanley A. Samad, 1959-1979, J.D.
Albert R. Raka*, 1979-1987, J.D. (interim)
Donald M. Jenkins, 1987-1987, LL.M.
Isaac C. Kunt, Jr., 1987, LL.B.

Graduate School

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. Brinntall, 1967-1968, Ph.D. (Dean of Graduate Studies and Research)
Edward L. Leivey, 1969-1974, 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. (Director of Graduate Studies and Research)
Alan H. Gentry, 1979-1986, Ph.D. (Dean of Graduate Studies and Research)
Joseph M. Walton, 1986-1989, Ph.D. (acting Dean of Graduate Studies and Research)
Patricia L. Carroll, 1989-1993, Ph.D. (Dean of the Graduate School)
Charles M. Dye, 1993, Ph.D. (Interim Dean of the Graduate School)

University College (formerly General College)

Thomas Summer*, 1963-1971, 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. (sacting)
Karla T. Mugler, 1993, Ph.D.

Evening College

L. L. Holmes, 1932-1934, M.A. (director)
Issue P. Hardy*, 1934-1953, M.S.Ed., L.H.D. (director)
William A. Rogers, 1959-1961, Ph.D. (dean)
Charles V. Blain, 1961-1969, M.A. (dean)
Caesar A. Cappino, 1974-1989, Ph.D. (dean)
Community and Technical College

W. M. PETRY*, 1964-1974, M.S.M.E.
ROBERT C. WEYNICK, 1974-1985, M.S.
JAMES P. LONG, 1987-1989, Ph.D.

College of Fine and Applied Arts

RAY H. SANDEFUR*, 1967-1978, Ph.D.
GERARD L. KNIEPER, 1978-1986, Ph.D.
WALLACE T. WILLIAMS*, 1987-1997, Ph.D.
DONALD E. HALL, 1997-1999, Ph.D. (acting)
UNDA L. MOORE, 1999-, Ph.D.

College of Nursing

ESTELLE B. NAES, 1967-1975, Ph.D.
LILIAN J. DAYOUNG, 1976-1986, Ph.D.
ELIZABETH J. MARTIN, 1986-1990, Ph.D.
V. RUTH GRAY, 1990-1992, Ed.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)

College of Polymer Science and Polymer Engineering

FRANK N. KELLEY, 1988-, Ph.D.
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Affirmative Action and Equal Employment Opportunity Officer
221 Broadway Building
Rooms 203, 204, 206
(216) 972-7300

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Nell M. Miles, Title IX Coordinator
(216) 972-7300