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the Bulletin

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Welcome

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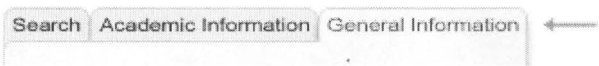
The Graduate Bulletin is divided into two main sections, General Information and Academic Information. In the General Information section, you can find a wide array of material dealing with many facets of your academic experience. In the Academic Information section, you can locate specifics on various academic departments, and the programs and courses they offer. The Graduate Bulletin also has a Search feature to help you quickly locate content from the two main sections.

To navigate between General Information, Academic Information, and the Search feature, click on the tab of your choice at the top of the right-hand menu.



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The University of Dayton

Founded in 1850

The University of Dayton is a private, coeducational school founded and directed by the Society of Mary (the Marianists), a Roman Catholic teaching order.[1] It is among the nation's largest Catholic institutions of higher learning. Aware of the richness of cultural diversity, representatives of many faiths are numbered among the University faculty and students. For the same reason, the University has consciously drawn its students and faculty not only from the immediate community and the midwest but from across the country and from numerous foreign countries.

The main campus of over a hundred landscaped acres is on a hill overlooking the city of Dayton, Ohio. The campus is made up of a well integrated architectural mix of old and new buildings that are both attractive and well-equipped. The faculty are excellent scholars who pursue knowledge in its rich variety and fine instructors dedicated to student learning and educational excellence. The University enrolls students from diverse social, ethnic, and economic backgrounds who are capable of and committed to learning, leadership, and service.

A lively, friendly atmosphere; numerous and varied religious, cultural, and social opportunities; an early-semester calendar allowing a number of study-recess options; intercollegiate and intramural athletic programs for both men and women; academic options such as honors programs, independent study, and study abroad; academic, professional, and personal counseling; cooperative work-study plans; a placement service for students and graduates-these exemplify the myriad aspects of the character of the University of Dayton.

[1]The Society of Mary, founded in France in 1817 by Father William Joseph Chaminade, presently conducts schools throughout the United States and in Africa, Australia, Canada, Japan, Europe, India, and Central and South America. The Society operates Chaminade University in Hawaii and St. Mary's University in San Antonio, Texas.

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Mission

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The University of Dayton is a comprehensive Catholic university, a diverse community committed, in the Marianist tradition, to educating the whole person and to linking learning and scholarship with leadership and service.

The University of Dayton is a comprehensive university committed to offering a broad range of programs in liberal arts, the sciences, and the professions at the undergraduate level, to providing selected programs on the graduate level to meet the needs of the community and region, to sponsoring timely continuing education programs. As comprehensive, the University views learning and scholarship as a shared task of discovering, integrating, applying and communicating knowledge at the intersections of liberal and professional education, across the disciplines, and through combining theory with practice.

As Catholic, the University commits itself to a distinctive vision of learning and scholarship that includes: a common search for truth based on the belief that truth can be more fully known and is ultimately one; a respect for the dignity of each human person created in the image and likeness of God; and an appreciation that God is manifested sacramentally through creation and the ordinary things in life. Ultimately, a Catholic vision of the intellectual life is based upon the acceptance of the revelation of God in Jesus Christ as it has been received and handed on by the Church. This challenge calls for integration of the human and the divine, reason and faith, and promotes true understanding through a person's head and heart. The University welcomes persons of all faiths and persuasions to participate in open and reflective dialogue concerning truth and the ultimate meaning of life.

Founded in the Marianist tradition, the University is committed to a vision of a distinctive educational community. As Marianist, the University focuses on educating the whole person in and through a community that supports and challenges all who become a part of it. The University forms an educational community thriving on collaboration by people from diverse backgrounds with different skills who come together for common purposes. The University as Marianist challenges all its members to become servant-leaders who connect scholarship and learning with leadership and service.

This university community-comprehensive, Catholic and Marianist-exists not for itself, but to render service. The University creates an environment in which its members, working in a scholarly manner, are free to evaluate the strengths and weaknesses of their own work and the work of others. In partnership, through the Research Institute, Campus Ministry, as well as numerous student organizations, the University works with others to improve the human community.

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Brief History

In the summer of 1849, Father Leo Meyer and Brother Charles Schultz, the first Marianist missionaries to America, journeyed from Alsace in France to Cincinnati, Ohio, where they intended to establish a base for the order in this country. They arrived, however, during a cholera epidemic, so Bishop John Purcell of Cincinnati soon sent Father Meyer to Dayton to minister to the sick of Emmanuel Parish. Here he met John Stuart, whose little daughter died of cholera the year before. Mr. Stuart wanted to sell his Dayton property and return with his wife to Europe. On March 19, 1850, the feast of St. Joseph, Father Meyer purchased Dewberry Farm from him and renamed it Nazareth. Mr. Stuart accepted a medal of St. Joseph and a promise of $12,000 at 6% interest in return for 125 acres, including vineyards, orchards, a mansion, and various farm buildings. Meanwhile, more Marianists arrived, and Nazareth became the first permanent foundation of the Society of Mary in the Western Hemisphere.

The University of Dayton had its earliest beginnings on July 1, 1850, when St. Mary's School for Boys, a frame building that not long before had housed farm hands, opened its door to fourteen primary students from Dayton. In September, the classes moved to the mansion, and the first boarding students arrived. Father Meyer served as administrator, Brother Maximin Zehler taught, Brother Schultz cooked, and Brother Andrew Edel worked as farmer-gardener.

Five years later the school burned to the ground, but within a year classes resumed. By 1860, when Brother Zehler became president, enrollment approached one hundred. The Civil War had little direct effect on the school because most of the students were too young to serve. St. Mary's grew as college preparatory courses were started in 1861. Then came a novitiate and a normal school for Marianist candidates. An old history refers to the period of 1860-75 as "the brick-and-mortar years." The Chapel of the Immaculate Conception was completed in 1869. In 1870, visitors marveled at new St. Mary's Hall, the largest building in Dayton, and called it "Zehler's Folly." The new "college department" moved into it in 1871. (St. Mary's Hall is now listed in the National Register of Historic Places.)

In 1882, the institution was incorporated and empowered to confer collegiate degrees under the laws of the State of Ohio. In 1883, another devastating fire visited the campus, but this time some of the buildings were saved. The statue now known as Our Lady of the Pines was erected in gratitude, and the following year St. Joseph's Hall was built, symbolizing the renewed confidence of the Dayton Marianists. In a more famous emergency, the school was spared by water as it had not been by fire. Because of its hillside location, it survived the Great Flood of 1913 untouched and was able to give shelter to 600 refugees.

St. Mary's had reorganized in 1902 into four departments-classical, scientific, academic, and preparatory. In 1905 it added the Commercial Department, which would become the Department of Commerce and Finance in 1921, the Division of Business Organization in 1924, and ultimately the School of Business Administration. Four engineering departments, appearing from 1909 to 1920, were to become the Engineering Division. In 1915, the Marianist training program (novitiate and normal school) was moved to Mount St. John's (now Bergamo Center).

Known at various times as St. Mary's School, St. Mary's Institute, and St. Mary's College, the school assumed its present identity in 1920, when it was incorporated as the University of Dayton. The same year, the elementary division was closed, the Division of Education was organized, and the University started

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its tradition of evening and Saturday classes to serve adults in the surrounding community. In 1922, the College of Law opened, also with evening classes. Other graduate programs followed, to augment the professional degree programs which distinguished the University from many of Ohio's other independent institutions of higher learning. In 1923, the first summer session was held; its classes, like those of the law college, were open to women as well as men.

The 1930s, with the Great Depression, were in many ways a time of retrenchment for the University of Dayton as for most other American schools. The Dayton Marianists had survived cholera, smallpox, and influenza, wars, fire and flood, and (in 1924) a Ku-Klux-Klan cross-burning on the campus. In 1935, even as the University turned its preparatory school functions over to Chaminade High School and graduated what was to be its last class in law for almost forty years, it inaugurated a college for women, with sisters of Notre Dame in charge of twenty-seven entering female students. Two years later, the college for women closed; all divisions opened to women, and the University became fully coeducational.

Enrollment had passed a thousand when World War II broke out. By 1950, with the return of the veterans, it reached more than 3,500. In 1967, it topped 10,000. But then, with the expansion of a community college and the establishment of a state university nearby, enrollment declined, and the resulting retrenchment was exacerbated by rising inflation and the energy crisis. Nor did the social turbulence and activism of the late 1960s and early 1970s bypass the University of Dayton. Some students and faculty protested against the Vietnam War, compulsory ROTC, and defense-related research activities. They campaigned also for changes in the curriculum, seeking more opportunities for meeting personal needs and goals. In response, the University gave greater responsibility to students for their own academic decisions, and it initiated interdisciplinary programs, self-directed learning, and various experimental courses and methods. Meanwhile, the profile of the student body changed. The 1960s saw significant increases in female and minority students. In the 1970s, there was a shift to a largely residential student body, and at the same time many more "nontraditional" (older) students matriculated. By the mid-1970s, total enrollment steadied at more than 10,000, with about 6,000 full-time undergraduates.

To keep pace with the University's growth, a series of building programs has more than tripled the number of major facilities since the Centenary Year of 1950. The University held its first general public fund-raising campaign in order to erect Wohlleben Hall in 1958 and Sherman Hall in 1960. Both campus and off-campus residences - dormitories, apartments, and houses - were added and improved as such emergency accommodations as surplus Army barracks and an adapted Army hospital (renamed the West Campus) were phased out.

A long-range environmental design has helped integrate new buildings and old, and made the campus more livable by increasing its beauty as well as its efficiency. In 1986, old and new combined in the much heralded architectural design of the Anderson Center between Rike Hall and Miriam Hall. When fire ravaged St. Joseph Hall in 1987, the University was able to rebuild and restore it without harming the architectural integrity of that historic corner of campus. Keeping pace with the needs of the University, the Jesse Philips Humanities Center opened in 1993, and Joseph E. Keller Hall was built for the School of Law in 1997. In addition, the University has renovated Miriam Hall, converted its child care center into an early childhood demonstration school called the Bombeck Family Learning Center and completed the first phases of a modern Science Center. In 2002, the University of Dayton Arena underwent a modernization, placing it among the best venues for basketball in the country. The Donoher Basketball Center, a major addition to the UD Arena giving UD a premier basketball facility for both playing and training, was dedicated in 1998.

As the University of Dayton enters the 21st century, it is building modern student facilities, including ArtStreet and Marianist Hall (2004) and RecPlex (2006), a fitness and recreation complex that will be more than twice the size of the current Physical Activities Center and serve a growing number of health-conscious students, faculty, and staff.

The edifices are not the only changes on campus. In 1960, the University reorganized academically and administratively. Administrative changes saw the formation of the College of Arts and Sciences from what had been two separate

units. Other divisions became the Schools of Business Administration, Education and Engineering. In 1970, the University charter was amended and lay members now joined the Marianists on the Board of Trustees. In 1974, the School of Law reopened.

Academically, the University has continued to expand and enrich its offerings and support services, especially since mid-century. Graduate studies, abandoned during World War II, resumed in 1960, with the School of Education leading the way. In 1969, the Department of Biology inaugurated the first doctoral program since 1928. The School of Engineering introduced two doctoral programs in 1973, and in 1992, the first doctoral degrees in educational leadership were awarded. In 1997, the Board of Trustees approved a doctoral program in theology with a focus on the Catholic experience in the United States. It was the first such doctoral program on a Catholic campus nationally.

In 1975, the Marian Library, which had grown to international renown since its inception in 1943, founded the International Marian Research Institute (IMRI), which was incorporated in 1984 as a branch of the Marianum in Rome. IMRI is empowered to confer licentiate and doctoral degrees in theology, with a specialization in Mariology. The Marian Library now holds the world's largest collection of print materials on Mary, the mother of Jesus.

For all undergraduates, a general education plan was adopted in 1983 to foster integration of the liberal arts in a professional education. In 1990, the Academic Senate approved a revision of the general education requirements that called for an integrated base of four humanities courses complemented by clusters of other courses, requiring various disciplines to focus on a single theme.

In 1986, the School of Business Administration established the Center for Business and Economic Research, now known as the Business Research Group. With an advanced information systems laboratory among its resources, the center provides contract research services for local business, government, and other organizations and support for faculty research.

The University has always maintained a tradition of innovation. In 1874, St. Mary's Institute's new Play House gymnasium was the only one of its kind in Ohio, and it is probable that the first organized basketball game in the state took place there. A system of elective studies was inaugurated in 1901. In 1924, the University was the first school to be granted a charter by the National Aeronautical Association. It was one of the first in the nation to offer a course in biophysics (1935). In 1948, it was a pioneer in student ratings of professors, and in 1952, it invited persons over 60 to attend its evening classes as guests. Its graduate program in laser optics was one of the earliest in the country. It was one of the first educational institutions to adopt electronic data-processing equipment and to offer degrees in computer science. In 1999, the University of Dayton was the first in the nation to offer an undergraduate degree program in human rights. In 2004, the University of Dayton partnered with Nanjing University, one of the top universities in China, to establish the University of Dayton-Nanjing University Suzhou Executive Training Center. The University will be the first American university in China's Suzhou Industrial Park (SIP) to provide graduate education to employees of American corporations and other international companies.

More than just a breeding ground for academic excellence, the University also responds to the needs of society and the region. Sponsored research at the University began in 1949 with a few faculty members and student assistants doing part-time research for industry and government agencies. In 1956, the University of Dayton Research Institute (UDRI) was formed to consolidate the administration of the growing research activities. Annual research volume has increased from $3,821 in 1949, to more than $60 million today. A center for discovery, development and technology commercialization, UDRI is the largest nonmedical research facility on a Catholic university campus.

From its humble roots as a private boarding school for boys, the University of Dayton today ranks among the best Catholic universities in the country. It is the largest independent university in Ohio and draws students from around the country and the world.

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Statement of Purpose

A graduate school, through its faculty, seeks to create and maintain the academic milieu for excellence in graduate work. Therefore, its influence and encouragement extend first to its own members and their scholarly activities. Because it conceives as the form and substance of graduate work not only the credits accumulated but the mastery of a subject and the understanding of its relationship to kindred subjects, the graduate school seeks further to impart to its students thorough knowledge in academic fields, special skills in research, and sharpened powers of independent thought. Yet, while it gives them the resources, the guidance, and the inspiration of a scholarly staff in its classrooms, laboratories, and libraries, it expects the students themselves to bring marked initiative and energies to their work and to assume full responsibility for the progress of their studies.

In short, graduate work for the student at the University of Dayton has as its purpose an integrated program of advanced study based on adequate undergraduate preparation in a specific field. It presupposes academic and personal maturity and makes more than an average demand upon the initiative, the industry, and the scholarship of the candidate for an advanced degree.

The official Statement of Purpose of the University of Dayton was approved by the Board of Trustees May 14, 1969:

The University of Dayton, by tradition, by legal charter, and by resolute intent, is a church-related institution of higher learning. As such, it seeks, in an environment of academic freedom, to foster principles and values consonant with Catholicism and with the living traditions of the Society of Mary. Operating in a pluralistic environment, it deliberately chooses the Christian world-view as its distinctive orientation in carrying out what it regards as four essential tasks: teaching, research, serving as a critic of society, and rendering public service.

The University of Dayton has as its primary task to teach-that is, to transmit the heritage of the past, to direct attention to the achievements of the present, and to alert students to the changes and challenges of the future. It regards teaching, however, as more than the mere imparting of knowledge; it attempts to develop in its students the ability to integrate knowledge gained from a variety of disciplines into a meaningful and viable synthesis.

The University of Dayton holds that there is harmony and unity between rationally discovered and divinely revealed truths. Accordingly, it commits its entire academic community to the pursuit of such truths. It provides a milieu favorable to scholarly research in all academic disciplines, while giving priority to studies which deal with problems of a fundamentally human and Christian concern. It upholds the principle of responsible freedom of inquiry, offers appropriate assistance to its scholars, and endeavors to provide the proper media for the dissemination of their discoveries.

The University of Dayton exercises its role as critic of society by creating an environment in which faculty and students are free to evaluate, in a scholarly manner, the strengths and weaknesses found in human institutions. While as an organization it remains politically neutral, objective and dispassionate, it encourages its members to judge for themselves how these institutions are performing their proper tasks; to expose deficiencies in their structure and operation; to propose and to actively promote improvements when these are deemed necessary.

The University of Dayton recognizes its responsibility to support, with means

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appropriate to its purposes, the legitimate goals and aspirations of the civic community and to cooperate with other agencies in striving to attain them. It assists in promoting the intellectual and cultural enrichment of the community; it makes available not only the resources that it possesses, but also the skills and techniques used in the accumulation and dissemination of knowledge; and above all, it strives to inspire persons with a sense of community and to encourage men and women of vision who can and will participate effectively in the quest for a more perfect human society.

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Administrative Structure

The University of Dayton includes the College of Arts and Sciences and four professional schools: the School of Business Administration, the School of Education & Allied Professions, the School of Engineering, and the School of Law. The deans, through their departments, administer the undergraduate and graduate programs. The dean of the Graduate School has the overall responsibility for all graduate programs, and the vice president for research administers all research activities connected with the University. At the head of the academic structure of the University is the provost.

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Academic Year

The University of Dayton operates on an early semester, split third-term calendar. The academic year begins with the fifteen-week fall term, which ends before Christmas. The winter term, also fifteen weeks, begins in January and ends early in May. The third, or spring-summer term, is split into two complete sessions of six weeks each.

The advantages of such a calendar are many. Students may enroll for the traditional fall and winter semesters and have a four-month summer vacation; or they may add half terms or full terms to enrich their programs or speed the completion of their graduate requirements. The University holds a commencement ceremony at the end of the Winter term and a graduation exercise at the end of the Fall term. Students who are employed have extra time in spring and summer, or they may enroll for the third term and work during the fall or winter term.

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Accreditation

The University of Dayton is officially accredited by the following agencies:

- The Accreditation Board for Engineering and Technology, Inc., for the programs in chemical, civil, electrical, and mechanical engineering and in electronic, industrial, and mechanical engineering technology
- The Association to Advance Collegiate Schools of Business (AACSB) for the baccalaureate, accounting and Master of Business Administration programs of the School of Business administration
- The American Bar Association for its School of Law
- The Commission on Accreditation for Dietetics Education (CADE) for the didactic program in dietetics
- The Association of American Law Schools for its School of Law
- The Human Factors and Ergonomics Society (HFES) for the Master of Arts program in experimental-human factors psychology
- The Masters in Psychology Accreditation Council (MPAC) for the Master of Arts program in clinical psychology
- The National Association of Schools of Music
- The National Council for Accreditation of Teacher Education
- The Higher Learning Commission of the North Central Association of Colleges and Schools[1]
- The State of Ohio Department of Education
- The Technology Accreditation Commission of Accreditation Board for Engineering and Technology for the programs in electronic, industrial, manufacturing and mechanical engineering technology

The University has the approval of the following:

- The American Chemical Society
- The League of Ohio Law Schools for its School of Law
- The National Association for Music Therapy

[1] The University of Dayton is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools http://www.ncahlc.org/
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Institutional Memberships

The University holds institutional membership in the following:

- The Academy of Criminal Justice Sciences
- The American Assembly of Collegiate Schools of Business
- The American Association for Higher Education
  The American Association of Colleges for Teacher Education
- The American Association of Collegiate Registrars and Admissions Officers
- The American Association of University Administrators
- The American Association of University Women
- The American Council on Education
- The American Dietetics Association
- The American Home Economics Association
- The American Library Association
- The American Society of Criminology
- The American Society for Engineering Education
- The Associated New American Colleges
- The Association of American Colleges and Universities
- The Association of American Law Schools
- The Association of Catholic Colleges and Universities
- The Association of College and University Housing Officers
- The Association of Governing Boards of Universities and Colleges
- The Association of Independent Colleges and Universities of Ohio
- The Catholic College Coordinating Council
- The College Entrance Examination Board
- The College and University Personnel Association
- The Comparative and International Education Society
- The Cooperative Education Association
- The Council for Advancement and Support of Education (CASE)
- The Council for the Advancement of Experiential Learning
- The Council of Graduate Schools
- The Council on Social Work Education
- The Dayton Area Chamber of Commerce
- The Dayton Art Institute (sponsoring)
- The Institute of International Education
- The League of Ohio Law Schools
- The Midwestern Criminal Justice Association
- The National Association of College and University Food Services
- The National Association of College Auxiliary Services
- The National Association for Foreign Student Affairs
- The National Association of Independent Colleges and Universities
- The National Association of Student Personnel Administrators
- The National Catholic Education Association
- The National Council of Catholic Bishops
- The National Scholarship Service and Fund for Negro Students
- The National University Teleconference Network
- The North Central Association of Colleges and Schools[1]
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- The Ohio Campus Compact
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- The PBS Adult Learning Satellite Service

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- The Society for the Advancement of Education
- The Southwestern Ohio Council for Higher Education

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[1] North Central Association, 30 N. LaSalle Street, Suite 2400, Chicago, IL 60602
(800) 621-7440
http://ncahigherlearningcommission.org

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Southwestern Ohio Council for Higher Education

Several corporations and numerous institutions of higher learning, including the University of Dayton, have organized the Southwestern Ohio Council for Higher Education (SOCHE). The participating institutions seek to increase inter-institutional cooperation, improve curricula, develop new courses and programs, share library resources, minimize costs, and centralize selected functions by using computers, modern educational technology, and communication media.

Among the benefits of SOCHE is that regularly enrolled full-time students at one institution, under certain conditions, may register for credit at no additional charge in courses offered by other SOCHE institutions in which no instruction is available at their own institution. Also available through the Council is the Air Force ROTC program.

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Related University Services

Besides the regular day sessions, the University conducts special as well as regular evening and summer sessions and offers short-term workshops, institutes, and conferences. All credited courses, whenever offered or in whatever form, conform to the same standards and are governed by the same policies and regulations prevailing during the regular day sessions.

Special Programs and Continuing Education especially serves the part-time students of the Dayton community to make the University and its course offerings, both credit and noncredit, more easily available to them. Similarly, the Office of International Services serves students from other countries who are enrolled at the University.

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Off-Campus Academic Centers

The University of Dayton maintains off-campus centers for graduate study in Education & Allied Professions (Lima, Columbus and Springfield); and Religious Studies (Fort Wayne, IN). All programs and courses are closely supervised by the deans of Education & Allied Professions and Arts and Sciences as well as the dean of the Graduate School. Most of these courses are taught by the faculty member teaching the same course on the main campus.

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Campus Ministry

Campus Ministry seeks to lead the University in fostering faith communities by promoting Gospel values and enabling the reign of God through proclamation, witness, and service.

Campus Ministry is committed to faith development. Regular and special celebrations of liturgy (e.g., Sunday Eucharist, daily Eucharist, and the Sacrament of Reconciliation) are scheduled. Involvement by students, including graduate students, as lay ministers (e.g. lectors, communion ministers, and music ministers) is important to these celebrations. Beyond liturgical celebrations, Campus Ministry provides opportunities for people to enhance their understanding of their faith through sacramental programs, retreats, guest speakers, faith-sharing groups, and other educational activities. Students are encouraged to participate in the planning and leading of these activities. Since the University is a Catholic University, significant emphasis is placed on worship for our Catholic population. Opportunities for worship are also provided for those who do not profess the Catholic faith.

Monday through Friday, Eucharist is celebrated in the Immaculate Conception Chapel at 12:05 p.m. The schedule for Sunday Masses in the main chapel is as follows: 10:00 a.m.; Noon; 6:00 p.m.; 8:00 p.m.; and 10:00 p.m. There is also a Mass at McGinnis Center at 9:00 p.m. The Sacrament of Reconciliation is available during seasonal Reconciliation Services, from 4:30-5:00 p.m. on Thursdays during the regular academic year, and upon request of any priest. Immaculate Conception Chapel operates as a `chapel of Holy Angels Parish on K Street that borders the campus. Sunday Masses at Holy Angels are held on Saturday evening at 5:00 p.m. and Sunday morning at 8:00 a.m., 9:30 a.m., and noon.

Campus Ministry is committed to a strong campus community. Creating welcoming communities is an element that makes the residence life ministry program distinctive. Campus ministers help students enhance the living of faith in daily life together. In addition to personal contacts, programs are created to fit student interests and needs: faith sharing and Bible study groups, retreats, prayer experiences, and service opportunities. The diversity of the campus is recognized and celebrated through special programs for our diverse student populations.

Campus Ministry is committed to justice, education, and service. The social dimension of the Church's mission is twofold: direct service to the poor and marginal and advocacy to change unjust structures that oppress and marginate people. The Center for Social Concern sponsors many peace and justice activities, immersion trips, and service clubs that provide students opportunities to participate in this important aspect of the mission of the Church. These activities provide students many opportunities to learn, lead, and serve.

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General Policy

The tuition and fee charges of the University are set at the minimum permissible for financially responsible operation, and in general these charges are less than the actual costs incurred. Gifts and grants received through the generosity of industry, friends, and alumni help to bridge the difference between income and costs. The trustees of the University reserve the right to change the regulations concerning the adjustment of tuition and fees at any time the need arises and to make whatever changes in the curricula they may deem advisable.

Tuition, fees, room and board may be paid in full before the term begins or, in the fall and winter terms, in five monthly payments with a 1% per month finance charge assessed on the ending balance. A one-time signed open credit agreement is required unless full payment is made initially. Late registration fees are assessed when scheduling and registration are completed after the start of the term.

All checks should be made payable to the UNIVERSITY OF DAYTON. The student's name and student identification number should be shown on the face of each check to insure proper credit.

An assessment of $25.00 + 1% of the check amount will be made for payment of tuition and fees by a bad check or for any other returned check from any area at the University. This assessment is made each time a check is dishonored.

Registration for a new term, transcripts of credit, and honors of graduation may be permitted only for students whose financial University records are clear.

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Tuition and Fees

Undergraduate per credit hour	$652.00
Graduate semester hour (Arts & Sciences and Engineering)	$601.00
SBA/MBA per semester hour	$655.00
Doctoral semester hour (including Engineering)	$683.00
Religious Studies per semester hour (Fall and Winter)	$452.00
Religious Studies Ph.D. Program	$512.00
MPA per semester hour	$410.00

School of Education and Allied Professions

On and Off campus per semester hour	$410.00
Educational Specialist per semester hour	$513.00
Doctoral per semester hour (education majors only)	$554.00
Secondary & elementary teachers & school Administrators (semester hours) - school related courses only (excluding doctoral)	$430.00

Education & Allied Professions Block Fees

Early Childhood Block	$55.00
Middle Childhood Block	$55.00
Special Education Block	$55.00
Adolescence/Young Adult Block	$55.00

Miscellaneous Fees

Application Fee (graduates & international students) -- online application free	$30.00
Credit by Examination per credit hour	$30.00
Late registration fee $25 per week (maximum $75)	$25.00
Late registration fee $15.00 per week SUMMER ONLY	$15.00
Lab fees per clock hour (maximum $250)	$50.00
University Fee	$25.00
Graduation Fee	$75.00

Audit Rates

(1/2 REGULAR CREDIT HOUR RATE ROUNDED TO NEXT DOLLAR)

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Per semester hour (except Education & Business)	$301.00
Education per semester hour	$205.00
SBA/MBA per semester hour	$328.00
Grad Religious Studies - secondary & elementary teachers & school administrators - per semester hour	$201.00
Education Specialist Program per semester hour	$257.00
Doctoral per semester hour	$342.00
Doctoral (Education Majors only) per semester hour	$277.00

Special fees are charged where applicable. Students receiving authorizations paying a portion of their tuition must pay the balance plus any additional fees.

An assessment of $25.00 plus 1% of the amount of the check will be made for payment of tuition and fees by a bad check. Cancellation of the student's registration may result until proper payment is made of tuition, fees, and special assessments.

Subject to change. The University reserves the right to make changes in its tuition and fees for any or all graduate courses at any time. Current information should be obtained from course composites, by contacting the department in which the course if offered, the Office for Graduate Applications & Records, or the Registrar's Office.

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Cancellations and Refunds

Cancellations will be allowed only after the completion of the proper drop-add procedures. For refund purposes, the effective date of cancellation is the date the student officially withdraws, not the last day the student attends class.

Students attending academic centers away from the main campus may contact the appropriate Dean requesting withdrawal. Requests for refunds must be in writing and addressed or e-mailed to the Bursar. Students who discontinue class attendance without officially completing the withdrawal process will be responsible for the full amount of the applicable tuition and fees.

Tuition refunds for cancellations in full terms will be made according to the following schedule:

During the first week of classes	80%
During the second week of classes	60%
During the third week of classes	40%
During the fourth week of classes	25%
During and after the fifth week of classes	0%

Tuition refunds for cancellations in less than full terms will be made according to the following schedule:

During the first week of classes	65%
During the second week of classes	30%
During or after the third week of classes	0%

Special withdrawal rules apply if the student has been awarded Title IV Federal Financial Aid. Please contact the Financial Aid office with any questions.

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Transcripts

A transcript of the permanent academic record is a confidential document to be released in compliance with the regulations of the Family Educational Rights and Privacy Act of 1974 as amended. The registrar will issue transcripts upon receiving a request signed by the student provided that no outstanding financial obligation to the University exists. All transcripts so requested require payment in advance. One complimentary transcript will be mailed to graduates within approximately six weeks after graduation.

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Assistantships and Fellowships

A limited number of graduate assistantships are available in the College of Arts and Sciences and the Schools of Business, Education & Allied Professions, and Engineering. These carry a stipend plus tuition remission for courses required in that degree. Recipients are expected to complete the master's degree in two years. Graduate summer fellowships for research and creative activities during the third term are also available to graduate students who wish to devote that term to a research project.

Detailed information and application forms may be obtained from the chair or director of the desired graduate program.

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Roesch Library

Roesch Library houses the book, journal, government document, and microform collections for both graduate and undergraduate students. Roesch Library is open 114 hours a week throughout much of the academic year and 24 hours per day during finals. Reference assistance is provided in a variety of forms including in person, email, live chat, telephone, and private consultations. The Roesch Library subscribes to over 200 databases on a variety of subjects and has current subscriptions to more than 8,000 journals in print and electronic formats. Its book and microform collections include nearly 1.2 million volumes. The Libraries are members of OhioLINK, a cooperative venture of university libraries and the Ohio Board of Regents. OhioLINK partners have created a common information network providing rapid access to and delivery of over 9,000,000 volumes available at college and university libraries across the state. All of the libraries affiliated with OhioLINK provide on-site borrowing privileges to students and faculty associated with the University. The Library also provides interlibrary loans from over 4,000 academic and research libraries around the world. The rare book and special collections, as well as the University Archives, are located adjacent to the library in Albert Emanuel Hall. Access to the Libraries Web page, databases, and online catalog is available at http://library.udayton.edu.

Roesch Library has a 50-seat computer lab called the DEC. Located on the second floor, the DEC provides access to the campus network, OhioLINK resources, and the Internet. These computers run Microsoft Office applications, SPSS, and other software and are available the entire time the library is open. All floors have data ports and wireless network hubs that allow students to access campus and information networks through notebook computers.

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Marian Library

The Marian Library, located on the seventh floor of the Roesch Library, is the world's largest collection of printed materials on the Virgin Mary. Its comprehensive collection is devoted to information about and references to the Virgin Mary found in works of Scripture, doctrine, history, tradition, art, culture, spirituality, and devotion. The multi-language collection includes over 95,000 books and pamphlets (6,000 of which were printed before 1800), 165 periodicals, a clipping file of over 60,000 items, and a growing number of microforms. These works are supplemented by a Marian stamp collection, Christmas crèche collection, statues, medals, postcards, and other works of art. There is also a general theological reference collection that is strong in bibliographical resources, early church literature, and religious art. Publications include *Marian Studies* (papers given at the annual meeting of the Mariological Society of America), *Marian Library Studies* (original research on Marian topics), and the twice-yearly *Marian Library Newsletter*. The Marian Library's collections can be accessed via the University Libraries' online catalog. Hours, an explanatory video, and information on current art exhibits can be found on the Mary Page (http://www.udayton.edu/mary/library).

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School of Law Library

The library of the School of Law is located in Joseph E. Keller Hall. Its collection exceeds 170,000 volumes.

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Access to Other Resources

The University Libraries are part of Ohio's pioneering OhioLINK project, linking the library resources of over 80 of Ohio's public and private academic and public libraries, and the State Library of Ohio. A delivery system among these institutions provides rapid delivery of requested materials, usually within three days. The library is an associate member of the Center for Research Libraries, giving it access to hundreds of additional specialized collections. The library is an active member of the Library Division of the Southwestern Ohio Council for Higher Education, which furthers access to regional libraries. Graduate students also have direct, on-site borrowing privileges with all OhioLINK libraries and with nearly all of the Southwestern Ohio Council for Higher Education libraries.

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Literature Searching

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Roesch Library subscribes, both independently and through OhioLINK, to over 200 databases. These provide information in almost every area of study offered by the University. Most are available both on and off campus. The library also has access to several hundred additional databases from a variety of commercial database providers. Librarians work with graduate students and faculty to search these resources when appropriate. There is no charge for this service.

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School of Education & Allied Professions Curriculum Materials Center

The Louis J. Faerber, S.M. Curriculum Materials Center houses the specialized collections of the School of Education & Allied Professions and is located in Chaminade Hall. Its collection offers elementary and secondary school teaching materials, filmstrips, recordings, transparencies, cassettes, charts, material kits, and other teaching aids and resources for graduate students. The center also houses research projects, theses, and dissertations completed in the School of Education & Allied Professions.

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Research Institute (UDRI)

As an integral part of the University, the Research Institute conducts sponsored research for industrial and government agencies. Areas of research are diverse and include aerospace mechanics, automotive, structural analysis, environmental sciences and engineering, information technology, electro-optics, computer modeling, hypervelocity impact, hazardous materials processing, materials engineering, materials and processes, manufacturing technology, nonmetallic materials, structural integrity, superconductivity, metals, ceramics, polymers, composite materials, microanalysis, human factors, and fracture mechanics.

While some research projects are conducted within the University's departments of instruction, the larger interdisciplinary projects are conducted by full-time research appointees in the Research Institute. Involvement of the teaching faculty and students, at both the graduate and undergraduate level, is encouraged as a means of enhancing the educational process.

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International Marian Research Institute (IMRI)

Johann G. Roten, S.M., Program Director

To facilitate and encourage Marian Studies in the United States and abroad, the International Marian Research Institute (IMRI) was founded in 1975 at the University of Dayton in affiliation with the Roman Pontifical Theological Faculty Marianum. Housed in the Marian Library, IMRI offers annual graduate-level summer schools on a three-year cycle to promote the programs of Marian Studies established by the Marianium. World-renowned theologians often join the faculty as guest instructors or lecturers.

Through IMRI, students can work toward a Pontifical Licentiate of Sacred Theology (S.T.L.) or Doctorate of Sacred Theology (S.T.D.)-each with specialization in Mariology-a certificate in Marian Studies, or a master's degree in religious studies with specialization in Mariology from the University's Department of Religious Studies, offered in a joint program. Course offerings include studies in Mariology, Christology, ecclesiology, spirituality, and theological anthropology.

Recognized as one of the world's leading centers for Mariological studies, the International Marian Research Institute also is committed to scholarly Marian research and the promotion of Marian art.

Admission is approved by the director of IMRI and an advisory council.

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Student Life and Services

The vice president for Student Development, the dean of students, and staff are responsible for assisting in developing and maintaining an environment which will support the educational goals and values of the University of Dayton. While students are encouraged to make decisions, it is understood that decision-making involves risks. The Student Development staff provides individual and group counseling and supportive reinforcement, treating all students as individuals. The responsibilities of the vice president and dean of students include University Residence Facilities, Residence Education, Critical Issues, Student Involvement and Leadership, Student Government Association, Campus Activities, Office of Community Standards and Civility, Educational and Special Programs, Orientation, Parents Weekend, Alcohol and Drug Abuse Prevention Education, Kennedy Union, Counseling Center, Health Center, Student Media, Commuter Students, Diversity Issues, Fraternities/Sororities, Recreational and Intramural Sports, Public Safety, and Dining Services.

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Residential Living

The University of Dayton maintains a limited number of diverse housing units for graduate students. There are approximately 64 spaces for first-year law students in University housing; the housing needs of upper-class law and graduate students may also be accommodated on a space-available basis. Graduate and law students interested in University housing should contact Residential Services at 937-229-3317 upon their acceptance.

Students are advised to coordinate their housing arrangements as early as possible. If University housing is not available, information can be provided regarding private housing in the Dayton area.

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Dining Services

University Dining Services operates three full-service dining facilities: Kennedy Union and Marycrest Food Courts operate a la carte service, and the VW Kettering dining hall provides all you care to eat dining.

Graduate students may use all dining facilities on a cash basis or for those who do not want to carry cash, the Flyer Express student debit account is also accepted.

For further information regarding Dining Services, please call 937-229-2441 or 1-800-259-8864.

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Flyer Express

Flyer Express is a declining-balance prepaid accpunt accessed with your Campus OneCard. It is the convenient way to pay for products and services on and off campus. Your Flyer Express eliminates the need to carry cash and saves you the hassle of searching for correct change. Flyer Express has you covered with whatever you need, 24 hours a day, 365 days out of the year. It is safe, fast, and convenient to use. The money on your Flyer Express account is carried over from one semester to the next and from year to year.

The Campus OneCard office offers you multiple options to deposit funds into your account

Online at http://flyerexpress.udayton.edu/AddFlyer.aspx

Phone: (937) 229-2456 or 1-800-259-8864

In person at the Bursars office in St.Mary's Hall

Flyer Express is accepted at all Dining Service locations, Art Street Cafe, UD Bookstore, Residence Hall laundry, Campus Copt Center, selevcted vending areas, KU Gift Shop, Galley, Rudy's Fly-Buy, Stuart's Landing, Campus Computer Store, Roesch Library, Post Office, The Chill, KU Box Office, Blend, Blend Express, and selected campus businesses. Visit the Campus OneCard website, http://onecard.udayton.edu/ or a current listing of off campus vendors that accept Flyer Express.

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Public Safety

The Department of Public Safety seeks to provide a safe and secure environment for the entire University of Dayton community, which includes the students, faculty, staff, and visitors. The department provides, police, parking, and emergency medical services. The Student Cadet program is also operated by Public Safety, which is located in Benisek Hall.

Police

Police operations include enforcement of laws and campus regulations, criminal investigation, crime prevention, and providing for the physical security of University of Dayton property and interests. The department has primary jurisdiction for law enforcement and criminal investigation on all University of Dayton owned or controlled property, and all public property within the defined campus boundaries according to the mutual aid agreement with the City of Dayton Police Department. Police officers are all graduates of the Basic Police Academy and are sworn law enforcement officers, the same as their municipal counterparts. All full time police officers are required to maintain certification to provide emergency medical services to the campus community.

Emergency assistance is available 24 hours per day, seven days a week. Call 911 in the event of an emergency, or 229-2121 for all other assistance.

Parking Services

Parking Services is responsible for management of the University's more than 3,800 parking spaces located in over 50 parking lots, and with enforcement of parking regulations. Lots are patrolled daily by Parking Services Representatives, who issue citations to violators. The following information applies to student parking.

- Campus parking facilities are extremely limited. We recommend you determine parking availability before bringing a vehicle to campus, as on street parking is also severely restricted in the vicinity of campus.
- All vehicles parked on University of Dayton property must have a valid parking permit displayed.
- First-Year residential students will NOT be permitted to bring vehicles to campus.
- Graduate/law students and graduate assistants will be sold student parking permits.
- Commuting students will be sold permits for Lot S1.
- Students living in landlord housing within one mile of campus will be sold resident student permits.
- Resident student parking priority will be given to upper class students with the highest priority being given to students with an internship or co-op, or senior education major.
- Information concerning permit sales will be disseminated to students annually.
- All students are required to apply online through the parking website at www.udayton.edu/~safety/parking.htm
- Evening students are sold N permits, which are valid in Lot B at 4:15 p.m., Lots A,C,P and S-1 at 4:00 p.m. and anytime weekends in any campus parking lot except those marked with a double letter. N permits will be honored in Lot S-1 anytime during the summer sessions.
- Students may contact Parking Services at 937-229-2128, M-F 8:00 a.m.-4:30 p.m.

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Rescue Squad

The Department of Public Safety also provides around the clock emergency medical services, primarily through the support of the University of Dayton Student Volunteer Rescue Squad, which is comprised of full-time undergraduate students. All UD Student Rescue Squad members are nationally registered EMT-Bs and volunteer their time to serve the community.

Student Cadet Program

Student Security Service Cadets are full-time undergraduate students who augment the Department of Public Safety's physical security and crime prevention efforts. Cadets operate the Campus Escort Service, providing free transportation within the university environs. They also provide security for the traditional residence halls according to a schedule coordinated with the Department of Residential Services.

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Campus One Card

The Campus OneCard is the official photo identification card of the University of Dayton. It provides easy access to numerous University facilities and services including Flyer Express, dining services meal plans, the RecPlex, Roesch Library, and building access.

Your Campus OneCard can be used as a form of payment for food, textbooks, supplies, laundry, printing and other essential services. It is safe, fast, and convenient to use.

To get your Campus OneCard, stop by the card office located in room 102 of the Powerhouse. The first Campus OneCard received is issued at no charge. All students must be registered for classes before getting their card. Visit the Campus OneCard website http://onecard.udayton.edu/ for a detailed view of the Campus OneCard program.

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Kennedy Union

The John F. Kennedy Memorial Union is the community center of the University. It provides facilities for students, faculty, staff, alumni, and guests of UD. The Union is designed to meet a wide variety of the University's needs. Facilities and services located on the ground floor include the Food Court, the Hangar games room, the Galley, and Pub. The Information Center, a gift shop, the Box Office, Boll Theatre, a travel office, the Commuter Lounge, television and radio studios, and the Torch Lounge are located on the first floor. The second floor includes the Ballroom, meeting rooms, Student Government Association, and office space. Additional meeting rooms are located on the third floor. For more information, contact the Information Center at 937-229-INFO.

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Department of Campus Recreation

The Campus Recreation Department provides a variety of intramural activities in which anyone can find exercise surrounded by a unique spirit of fun and competition. Activities include softball, flag football, indoor and outdoor soccer, volleyball, basketball, dodge-ball, corn-hole, ultimate frisbee, bowling, racquetball, baseball, life-preserver water polo, walleyball, and floor hockey. All students are invited to participate; ability is not important - just the desire to play. You may find out more about intramurals in the RecPlex Office which is on the mezzanine level in the RecPlex. Please stop by and ask about our programs.

Inside the RecPLex is an aquatics center which houses a 25 yard lap pool, a vortex family area, a diving well, and a hottub. There is also a 4 court hardwood gym, which accommodates both basketball and volleyball, 3 racquetball courts, a 2 court MAC gym with synthetic flooring, a climbing wall, meeting rooms, aerobic studios, a running track, and a 150 piece weight lifting and cardio fitness center.

Another popular feature of the Campus Recreation Department is the Sports Club Program. Currently, there are twenty-four recognized sports clubs on campus. The Sports Club Program offers students the opportunity to participate on a competitive level, while at the same time learning and developing new skills. Anyone interested in joining a sport club or starting a new one is encouraged to come in and speak with the Associate Director of Campus Recreation.

Schedules concerning free play hours and scheduled events may be secured from the Campus Recreation Office in the RecPlex at 229-2731 or the Front Desk by calling 229-2704.

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Campus Recreation

The Department of Campus Recreation is located on the "M" level of the RecPlex. The RecPlex, which opened in January 2006, houses a state of the art recreation facility. The facility may be used at no added expense by all full time undergraduate students. The facility may be used by graduate students who purchase a RecPlex Membership. Highlights of the building include:

- Main Gym with four full sized wood court basketball courts and three racquetball courts, one of which can be converted for squash.
- MAC Gym with two rubberized courts surrounded by a professional grade dasher board system adequately sized to play a variety of sports including tennis, indoor soccer, basketball, volleyball, and floor hockey.
- Aquatic Center with a 25 yard eight lane lap pool, four foot deep vortex leisure pool, diving well, and an eight-person spa.
- Fitness Studios A, B, and C which are used for a variety of instructional and group fitness classes.
- 10,000 sq. ft. Fitness Floor is home to 80 cardio machines and 70 strength training stations.
- Wellness Assessment Lab from which services such as athletic training, massage, and personal training consulation are offered.
- Four lane 1/8 of a mile rubberized jogging track.

Campus Recreation provides a variety of intramural activities in which anyone can find exercise surrounded by a unique spirit of fun and competition. Activities include softball, flag football, indoor and outdoor soccer, volleyball, basketball, dodge-ball, corn-hole, ultimate frisbee, bowling, racquetball, baseball, life-preserver water polo, walleyball, and floor hockey. All students are invited to participate; ability is not important, just the desire to play. Please stop by and ask about our programs.

Another popular feature of the Department of Campus Recreation is the Sports Club Program. Currently, there are 26 recognized sports clubs on campus. The Sports Club Program offers students the opportunity to participate on a competitive level, while at the same time learning and developing new skills. Anyone interested in joining a sport club or starting a new one is encouraged to come in and speak with the Sports Club Coordinator.

Schedules concerning free play hours and scheduled events may be secured from the Campus Recreation Office. For more information. please visit www.udayton.edu/~recsport/ or call 229-2731.

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Health Center

Medical care is available at the Health Center to all full-time and part-time undergraduate, graduate, and law students. During the academic year, the Health Center is open from 8:30 a.m. to 6:00 p.m. on weekdays, except University holidays. A physician is available for consultation every weekday morning and afternoon throughout the year, except University holidays. Summer hours are 8:30 a.m. to 4:30 p.m. with limited physician hours. Students should call the Health Center to schedule an appointment at 93131 or 937-229-3131. In case of emergency, call Public Safety, 937-229-2121.

Pre-admission physical examinations are not required, but students with chronic health problems are advised to have their physicians send records or recommendations to the medical director. Every student born after 1955 is required to show evidence of immunity to measles, mumps, and rubella. Students fill out these dates as part of the on-line admission process.

Undergraduate and law students pay a Basic University Fee, which covers the cost of services at the Health Center. Graduate and ELMI students, who do not pay this fee, are charged for services received at the Health Center. The charge for a physician visit ranges from $45 to $75, depending on the length of the visit and the type of services provided. Charges are made for all students for medicines dispensed, allergy injections, laboratory tests, and x-ray examinations.

All charges incurred at the Student Health Center are reported to the Bursar to be entered on the student's account with the University. Inquiries regarding bills or University-sponsored insurance should be made at the Health Center between 9:00 a.m. and 3:00 p.m. weekdays. Itemized statements can be provided upon patient request. These are not automatic and the Health Center does not bill outside insurance companies directly, however students should bring a copy of their health insurance/pharmacy cards to each visit.

Full-time graduate and law students (6 hours or more) and undergraduates students are eligible for University-sponsored health and accident insurance. For information about this program, visit the Health Center, or call 937-229-3131.

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Affirmative Action and Employee Development Office

The Affirmative Action and Employee Development Office provides services to the University's staff and faculty in three areas: Affirmative Action/Equal Employment Opportunity (AA/EEO) Compliance, staff development minority faculty, and graduate student recruiting.

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Center for International Programs

The Center for International Programs provides leadership, coordination, and administrative support for the development of international understanding and sensitivity among the University's faculty, staff, and students through research, study abroad, exchanges, services to international students and scholars, and other programs. It serves in an advisory capacity and as a resource center to assist academic units strengthening the international dimensions of their curricula. It is also committed to community outreach through conferences, seminars, speakers, and workshops organized in cooperation with the University's academic units and community agencies.

The center coordinates and provides administrative support for study abroad and other international educational programs through its Office of Study Abroad. The Office of Study Abroad is also a resource center for information on non-UD sponsored programs. In addition to the Office of Study Abroad, the Center for International Programs also oversees the Office of International Student Services. This unit advises all University of Dayton international students and provides support through academic, social, and cultural programming.

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International Services Office

The International Services Office handles immigration and provides academic and non-academic advising, orientation, cultural, and other programming services for international students and scholars on campus. It also organizes cross-cultural workshops with faculty and staff to create a supportive environment for international students and scholars.

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Counseling Center

In keeping with the University's dedication to educating the whole person, the Counseling Center is designed to assist students in self-development. Graduate and law students may find a time when they need an "objective third party" with whom to express their feelings and thoughts about personal situations. Difficulties with decision-making, interpersonal relationships, loneliness, family-marital issues, career choice, and insomnia are some concerns that postgraduate students may encounter. The center provides an atmosphere in which these, or any other issues, can be discussed freely and openly. Students decide to what extent they want to divulge personal information. Strict professional confidentiality is maintained at all times. No information regarding conversations leaves the center without the students' permission except in the case of life-threatening situations,receiving a court order, or when evidence suggests abuse or eddangerment to a person under the age of 18 or over 60. The University and the student may enter into an agreement to establish conditions regarding treatment/assessment, if there is imminent danger.

All undergraduate law students, and Graduate Assistant pay an initial student fee to cover the cost of these services. Non-Graduate Assistant Graduate students are not initially charged a fee for these services. If a Non-Graduate Assisstant graduate student chooses to use the center and its facilities, a fee of $50 for each individual session and $30 for each group session will be charged. This fee is payable at the time of services or can be charged to the individual's Bursar account.

Full-time students can be seen on a non-time-limited basis. Part-time graduate students are limited to 10 sessions.

Appointments can be made in person or by phone. Making an appointment is customary. If an emergency arises, however, contact the Center, and students will be seen as soon as possible.

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Privacy Rights of Parents and Students

In compliance with Section 438 of the General Education Provisions Act, the University of Dayton has published regulations designed to protect the privacy of parents and students as to the access and to the release of records maintained by the institution (see University of Dayton Student Handbook).

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Student Handbook

Each student at the University of Dayton is responsible for knowing and observing the policies, regulations, and procedures contained in the official student handbook. This publication also provides useful information on such subjects as University services, student organizations, and resource numbers.

The "University of Dayton Standards of Behavior" section of the Student Handbook is printed in booklet form and distributed to all residents of UD owned housing facilities. This booklet is also available at the Kennedy Union Information Desk for students living in other residences.

The entire Student Handbook is available at this website:
http://www.udayton.edu/~studev/studenthandbook

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Residence Education Residence Coordinator

The Department of Residence Education seeks to intentionally engage students in the integration of a strong liberal arts education with their development as citizens and lifelong learners. The department offers graduate assistantships, as residence coordinators, in a variety of residential areas to help accomplish this effort.

A student must be accepted into a graduate program to be eligible for a residence coordinator position. For more information, please call 937-229-3321. Remuneration includes stipend, room, board, tuition remission, and a health insurance option. Submit applications and resumes to:

Department of Residence Education
206 Gosiger Hall
Dayton, Ohio 45469-0965

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Office of Student Involvement and Leadership

The Office of Student Involvement and Leadership provides support, direction, and programming opportunities for students and officially recognized student organizations in an effort to enrich and enhance academic life and foster a spirit of community. In addition, the office is responsible for registering all student organization-sponsored events, granting recognition to all student organizations, approving funding, providing assistance for organization advisors, publicity approval, programming the Flyer TV information channel, coordinating campus-wide events, and planning leadership workshops and retreats.

The office works directly with commuter students, the FLYER NEWS, FLYER RADIO, DAYTONIAN, ORPHEUS, Campus Activities Board, Distinguished Speakers Series, Christmas on Campus, fraternities and sororities, and all professional, honorary, academic and special interest organizations.

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Career Services Center

The mission of the Career Services Center is to integrate classroom theory with the reality of work by developing employment opportunities for the University's undergraduates, seniors, graduate students, and alumni. The center educates students in the career development process so that upon graduation they will have attained the self-awareness, competence, and autonomy needed to take responsibility for their future. The center's focus is on aspects of the development of the University of Dayton student which deal with the evaluation, selection, and pursuit of an optimum career.

Career placement services and programs are designed to complement and enhance the academic mission of the University. Full-time and part-time graduate students may use the services of the center as they approach graduation. Services include career consultations, on-line job postings, Career Fair, on-campus recruiting, and Alumni Career Network.

Career advisors are available by appointment only. Appointments can be made in person or by calling 937-229-2045. Discussion of job search strategies, resume critique, networking and interview tips will be included in this session.

For a fee of $10 a student can register with the Career Services Center and establish a resume in the center's database. Employers register with the center, post positions on-line, and search this database for potential hires.

The Career Fair is an annual event held in September. Over 90 companies offering a variety of career opportunities attend each year.

The on-campus recruiting program is open to all full-time graduating students. On-campus recruiting is held October-April each year.

In addition to these services, the Career Services Center offers the following resources:

- On-line access to Web sites and job listing sites
- Alumni Career Network-Network on-line with over 3,000 alumni nationwide
- Career Library

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General Academic Information

The academic requirements and regulations described in this chapter are those of the University which, unless otherwise noted, take precedence over all others and apply to all graduate students. The student is expected to assume full responsibility for knowing and following all pertinent regulations and procedures of the graduate school as set forth in this Bulletin and for meeting the standards and requirements expressed herein.

The admission of candidates, their continuance and status, the awarding of academic credits, and the granting of degrees are all subject to the ordinary regulatory powers of the University. The University reserves the right to withhold or cancel, at its discretion, any of these privileges for reasons considered sufficient by its own governing body.

The University of Dayton presently awards the following degrees beyond the Baccalaureate:

- Master of Arts
- Master of Business Administration
- Master of Computer Science
- Master of Financial Mathematics
- Master of Public Administration
- Master of Science
- Master of Science in Aerospace Engineering
- Master of Science in Applied Mathematics
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Education and Allied Professions
- Master of Science in Electrical Engineering
- Master of Science in Electro-Optics
- Master of Science in Engineering
- Master of Science in Engineering Management
- Master of Science in Engineering Mechanics
- Master of Science in Management Science
- Master of Science in Materials Engineering
- Master of Science in Mechanical Engineering
- Educational Specialist in Educational Leadership
- Educational Specialist
- Juris Doctor
- Doctor of Engineering
- Doctor of Philosophy in Biology
- Doctor of Philosophy in Educational Leadership
- Doctor of Philosophy in Electro-Optics
- Doctor of Philosophy in Engineering
- Doctor of Philosophy in Theology

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Admission

All graduates of approved colleges or universities who hold the bachelor's degree are eligible for admission. Applicants must have had adequate undergraduate preparation in their proposed fields of study and must show promise for pursuing higher studies satisfactorily.

The application for admission to graduate work, available on-line at http://gradadmission.udayton.edu/application, should be submitted by August 1 for the first term, by December 1 for the second term, by April 1 for the third term, and by June 1 for the second half of the split third term. It is the responsibility of the student that the application, with all necessary supporting documents, be complete and in order. Registration as a graduate student will not be permitted otherwise.

Upon admission, students are designated as full-time or part-time by their deans or program directors. The determination of such status for graduate assistants, students engaged in research, and, in general, all graduate students is made by their respective chairs.

Graduate students are also classified according to their relationship to formal programs, as follows:

1. **Regular status**-the student who has met satisfactorily all the general requirements of the College or School and the specific requirements of the department in which the program is offered.
2. **Conditional status**-the student who must fulfill some prerequisite imposed by the school or department before admission to regular status, and the student whose preparation cannot yet be determined.
3. **Non-degree status**-the student belonging to either of these categories:
   -the student will not be officially enrolled in a graduate program leading toward a degree;
   -the student fulfills all the requirements and is taking courses for credit but is not seeking a degree.
4. **Transient**-a properly qualified student working toward a degree in another institution who has written authorization from the dean of that institution to take specific courses at the University of Dayton for transfer of credit. The transient student must satisfy all registration requirements of the given course that are mandatory for students working for a degree at the University of Dayton.

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Application

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The application form may be submitted on-line at http://gradadmission.udayton.edu/application. There is no application fee for an application submitted on-line.

Official transcripts must be submitted directly from the registrars of all previously attended colleges or universities to the Office of Graduate Admission Processing. Registration will be permitted only when the final transcript (showing the university seal and highest degree attained) is on file.

Letters of reference should be completed by professional persons able to judge the applicant's academic qualifications for the proposed field of study and returned to the Office of Graduate Admission Processing.

The University of Dayton operates under an early semester, split third-term calendar. The first term begins in late August; the second term in early January; the third term, first session, in May; and the third term, second session, in June.

It is the applicant's responsibility to see that all required documents are on file at least one month prior to the beginning of the term for which admission is sought.

Admission Tests

- GMAT: required by the School of Business Administration
- GRE: required by the Departments of Biology, Communication, and Psychology
- MAT: suggested for the clinical psychology program

All applicants for graduate assistantships should include a statement, not to exceed 1,000 words, describing academic preparation, vocational objectives, and particular interests in their field of study. Application deadlines vary by program and applications should be submitted directly to the department.

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International Graduate Student Admission

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International students can visit http://gradadmission.udayton.edu for information and to submit an on-line application.

International students should apply by March 1 if enrolling for the fall term and by July 1 if enrolling for the winter term. Permanent residents and Asylees/Refugees may complete the same on-line application.

Applicants with international credits seeking admission to graduate programs at the University must have completed a minimum of sixteen years of education, including the earned equivalent of a four-year bachelor's degree from a regionally accredited institution. Applicants must also present evidence of outstanding success in the chosen field of study.

Program-specific admission requirements are listed on the graduate admission website at: http://gradadmission.udayton.edu

In general, all international applicants are required to provide the following items:

1. A submitted on-line application completed at the following URL: http://gradadmission.udayton.edu
2. A complete official academic record of all previous schooling. This record must include dates of attendance, all subjects studied, grades earned and marks achieved on all examinations. Documents must be sent directly from the institutions attended to the University of Dayton. These credentials must be accompanied by a certified English translation.
3. Three letters of recommendation, preferably from professors at the undergraduate school(s) attended. Letters should be original, on official stationery, and include complete contact information.
4. A personal vita or statement including work experience, research study or experience, and professional development objectives.
5. Official scores from the Test of English as a Foreign Language (TOEFL). A minimum score of 550 on the paper-based test (PBT) or 213 on the computer-based test (CBT) is required for full admission. An applicant who is academically qualified but who has submitted a score of 500-527 PBT or 173-193 CBT may be conditionally admitted to the University with the agreement that he or she will attend, full-time, UD's English Language and Multicultural Institute (ELMI) 15-week semester program. An applicant with a TOEFL score between 530-547 PBT and 197-210 CBT may be admitted with the condition that he or she will attend ELMI part-time and register for a part-time academic load. Upon successful completion of ELMI and achievement of an institutional TOEFL score of 550 or the equivalent, full admission will be granted.
6. Master of Business Administration (MBA) applicants must furnish official scores from the Graduate Management Admission Test (GMAT). Most departments in the Schools of Education and Allied Professions, and Arts and Sciences require official test scores from the Graduate Record Examination (GRE). The School of Engineering does not require the GRE. However, applicants are welcome to submit an official score along with other supporting documents.
7. Evidence of financial support to cover all tuition and living costs in the United States. An original bank statement, with account number and cash balance, indicating sufficient liquid funds for the first year's expenses. A letter from the sponsor indicating the extent of financial support to be provided for each year of study. The approval of currency exchange and export of funds (if applicable) must be obtained.

Government-sponsored students should send a letter from the government indicating support and billing information.

Requests for hard copy information and a paper application for graduate study should be made to: Graduate Admission Processing, 300 College Park, Dayton, OH 45469-1323, 937-229-4464 phone, 937-229-4729 fax. A $30 non-refundable application fee will be charged for processing all paper applications.

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Veterans

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The University of Dayton has been approved by the State Approving Agency for Veterans Training to distribute Veterans Benefits. Students must complete and submit a Veterans Schedule Form each semester to receive their educational benefits. Any changes must be reported to the Veterans Affairs Office. Failure to report changes may result in cancellation of Veterans Benefits. The Veterans Affairs Office is located in Albert Emanuel Hall, first floor.

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Undergraduate Students in Graduate Courses

An undergraduate student may register for graduate courses only under the following conditions:

1. Graduate courses to count toward the undergraduate degree:
   a. Approval must be obtained from the director of the appropriate graduate program.
2. Graduate courses to count toward the graduate degree:
   a. Approval must be obtained from the director of the appropriate graduate program.
   b. The student must be within 15 semester hours of completing the semester-hour requirements for graduation in the undergraduate program.
   c. Credit obtained for the graduate courses may not be counted toward both the bachelor's degree and any future master's degree.
   d. The undergraduate student whose status is less than full-time or 3/4-time must pay the graduate tuition rates to register in graduate courses for graduate credit.

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Advising

Initial academic advising is usually done by the program director or a temporary advisor. Following this, the graduate student may be assigned to a permanent advisor or a graduate committee. In either case, all details of the program will be decided by the student and advisor.

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Registration for Courses

The responsibility for being properly registered rests with the student. Registration is required each term or session of all students who enter coursework for credit and of all students who wish to audit courses. The written approval of the proper dean or the designated director or advisor is required for admission to any course. Any student who has interrupted the normal sequence of a graduate program is required to apply to the designated advisor or program chair for permission to resume study at least four weeks prior to the first day of the term.

All students should consult the Graduate Composite for each term well in advance of registration to determine the scheduling of courses. Students enrolling at the off-campus centers should note that although the scheduling of off-campus classes follows the general pattern of the University calendar, they do not necessarily conform to the on-campus academic dates in all details.

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Master's and Doctoral Degree Requirements

The College of Arts and Sciences and the Schools of Business Administration, Education & Allied Professions, Engineering, and Law offer programs variously distributed in time, leading to the master's and doctoral degrees. Specific requirements and sequences leading to these degrees are described in Academic Information, as are the specific curricula, courses, and requirements of the divisions and departments offering them.

Residence Requirement

For the master's degree, at least 24 semester hours of credit, or its equivalent, should be taken from the University of Dayton.

For the doctoral degree, two-thirds of the semester hours required beyond the master's degree should be taken from the University of Dayton. Generally, this is 48 semester hours beyond the master's degree. For the doctoral degree, a student must be a full-time student for at least two semesters or the equivalency.

Transfer Credits

A maximum of two courses of graduate work may be transferred from other accredited institutions to the University of Dayton provided the work is of B grade or better. The quality points are not transferred. Usually, no transfer credit will be allowed for courses taken more than five years previous to matriculation in the graduate schools of the University of Dayton.

Exceptions to this policy may be made with the approval of the dean of the Graduate School.

Advanced Undergraduate Courses

Some programs permit certain 400-level undergraduate courses to be applied to graduate program credit requirements. When such courses are permitted for graduate-level credit, the work done shall be of the grade of B or higher for that credit to be accepted toward a degree. The student must pay the graduate tuition rates when registering in these courses for graduate credit.

Elective Courses

Most graduate programs allow, and encourage, the student to select one or two courses from other related disciplines. Consult the advisor or program director for details.

Foreign Language Requirement

At the discretion of the department offering a particular program, a reading knowledge of a foreign language may be required for the master's degree. Graduate students can take language courses on a class or tutorial basis by special arrangement through the Department of Languages, College of Arts and Sciences. No graduate credit is allowed for the fulfillment of language requirements.

Comprehensive Examination

A comprehensive examination is required in most programs. This examination may be oral or written, or both. Application for any comprehensive examination must be approved by the chair of the student's major department at least two weeks prior to the examination. For further details, consult the explanation under

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the appropriate individual program in Academic Information.

Thesis and Other Requirements

Students in a program requiring a thesis, an equivalent project, a candidacy examination, or a dissertation may begin work only with the approval of the program director or of an advisor delegated with the authority to give it. Both the form and the content of the final work must be approved by at least three members of the department, including the faculty advisor and the chair or director.

The Manual for the Preparation of Graduate Theses and Dissertations is available from the Office for Graduate Applications & Records, 117 St. Mary's Hall or the Office for Graduate Studies and Research, 200 St. Mary's Hall.

Final copies of a master's thesis in approved form must be submitted at least two weeks before the date of graduation. Students in doctoral programs should consult appropriate sections of this Bulletin for requirements concerning candidacy and such matters as the number of copies of the dissertation, as well as for regulations governing topics, approval, and procedures.

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Criteria for Serving On and Chairing Master's Thesis and Doctoral Advisory Committees

Composition of Master's Thesis Committee

Graduate faculty status is a prerequisite to chairing a master's thesis committee. A master's thesis committee must consist of a minimum of three members, at least two of whom must be members of the graduate faculty.

Composition of Doctoral Advisory Committee

Graduate faculty status is prerequisite to chairing a doctoral advisory committee. Additional criteria for chairing dissertation committees may be prescribed by the appropriate academic division. A doctoral advisory committee must consist of a minimum of four members, at least three of whom must be members of the graduate faculty. One of the members must be an external member whose primary appointment is outside the candidate's program or department, or outside the University. The external member must be familiar with the standards of doctoral research and should be in a collateral field supportive of the student's dissertation topic. It is strongly recommended that this member have graduate faculty status, if from another graduate program.

The composition of the doctoral advisory committee is recommended by the chair of the relevant department/program, requires concurrence by the dean (or designate) of the academic division, and approval by the dean of the Graduate School.

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Sufficient Progress

Students are expected to maintain sufficient progress toward a degree. At various intervals, usually at each registration period, and especially at the midpoint in the program, the advisor or program director will discuss the rate of progress with the student. Students not showing promise of completing the program in a reasonable time may be advised to withdraw from the University.

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Appeal for Change of Grade

Any appeal for change of grade for a particular course should be directed to the dean of the academic division in which that course is offered.

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Time Limit

All requirements for a master's degree must be satisfied within seven calendar years from the time of matriculation.

All requirements for a doctoral degree must be satisfied within five calendar years after admission to candidacy.

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Second Master's Degree

In some cases, a student who either possesses a master's degree or currently studying toward one, wishes to obtain an additional master's degree in a related field. Only six semester hours from the first program may be applied toward the requirements of the additional degree.

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Academic Standards

To be in good standing, a graduate student must maintain a 3.0 quality point average at all times. Grades are expressed on the student's permanent record in the following manner:

A - Excellent: for each semester hour, 4.0 quality points are allowed.

A- - For each semester hour 3.6667 quality points are allowed.

B+ - For each semester hour, 3.3333 quality points are allowed.

B - Good: for each semester hour, 3.0 quality points are allowed.

B- - For each semester hour, 2.6667 quality points are allowed.

C - Passing: for each semester hour, 2.0 quality points are allowed.

F - Failed: 0 quality points are assigned.

CR - Passed: Credit is given, but no corresponding quality points are given. This is used by certain departments when the thesis or special courses are not to affect the 3.0 cumulative quality point average needed to be in good standing.

I - Incomplete: To be used when a course has terminated but the student, for an acceptable reason, has not completed the work of the course. *The I has 0 quality points per hour and does not affect the cumulative point average. It can be changed to a letter grade if the student has completed the work. Otherwise it will remain on the permanent record indefinitely.*

K - Credit: This mark is used only for credits accepted as transfer credit from other institutions. No quality points are allowed.

P - In Progress: For the thesis or for courses which have not terminated at the end of semester. After the course or thesis is completed, the P is replaced on the permanent record by an A, B, C, F, or with the corresponding credit and quality point average.

N - No grade was reported by the instructor.

W - Withdrawal: Any withdrawal or change of course must be processed by an official Drop-Add Form through the Registration office, with the approval of the graduate student's advisor. During the first three weeks of a full term (or 10 calendar days of a split term) a graduate student may withdraw from a class without record. Financial adjustments, if allowed, will be made only from the date of notification of withdrawal.

X - Audit: This mark indicates that the graduate student has registered to audit the course. No credit hours or quality points are awarded for this mark. NOTE: *Any course taken for audit may not be retaken for credit.*

Em - Examination: This mark indicates credit given to students (registered in the University) on the basis of examinations after admission to the University. The level of achievement to be demonstrated by the student on these examinations is determined by the department in which the course is taught. Such credit shall be assigned only on authorization of the dean of the academic division in which the student is registered. No quality points are allowed.

The various deans will review at intervals the work of their graduate students,

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and in consultation with the program directors and/or chairs of the departments, will recommend that those who are not doing work of high caliber be advised to discontinue courses leading to a degree. The disciplinary authority of the University is vested in the president by right, and in the deans and other officers on whom jurisdiction may be conferred for specific cases and in restricted areas.

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Interdisciplinary and Joint Studies

For information regarding Interdisciplinary and Joint Studies, Contact the Program Director or:

Thomas Eggemeier, Dean, Graduate School

Edward Mykytka, Associate Dean, Graduate School

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Individual Interdisciplinary Programs

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The University of Dayton offers individual interdisciplinary graduate programs designed by the student in cooperation with an advisor and representatives from the selected programs. Applicants must have an undergraduate degree with a general cumulative point average of 2.8 or above, and submit a formal written request for an individually designed interdisciplinary program to her/his faculty advisor and graduate committee.

The interdisciplinary program does not take the place of an established graduate program. Rather, it is a specific program drawn from several disciplines to meet a special need, frequently for job-related requirements. It must produce interrelated applications of specific disciplines and skills at the graduate level. For instance, a clinical dietitian employed in a hospital may seek graduate level expertise in counseling and education for patients with chemical dependencies and for teaching interns. Such a student finds that a Master of Science in the interdisciplinary program serves the special needs for a broader knowledge base encompassing physiology, communication, and counseling. Or, to take an instance in the humanities, a student may seek graduate level expertise in historical preservation. Such a student seeks more general learning and professional expertise, and finds that a Master of Arts in the interdisciplinary program serves special needs in history, art, and public administration.

The degree will be either a Master of Arts or a Master of Science. The program should involve several disciplines and be directed by one faculty member from each discipline. The three faculty members constitute the advisory committee. The final program will be drawn up and approved by the advisory committee. Copies will be sent to the chair of the departments involved.

A program of study must be at least 30 semester hours: 15 may be divided between directed study and a thesis, but must be related to the interdisciplinary areas; and 6 semester credit hours of electives in more distantly related areas may also be chosen.

The formal request for an individual interdisciplinary program must include:

1. A general description of the proposed course of study and the reasons for choosing such an interdisciplinary program, rather than one offered in a single department.
2. The courses (at least 30 semester hours) which will be taken and the department involved in the overall work.
3. If a project or thesis is desired, a clear statement of the specific nature of the topic, the research intended, and the purpose of the project or thesis.

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Other Interdisciplinary Programs

Juris Doctor/Master of Business Administration Program

Program Directors:
Kelvin Dickinson, Associate Dean for Academic Affairs, Law School
Janice Glynn, Director, MBA Program, School of Business Administration

The JD/MBA joint degree program is an integrated program of studies which leads to both the Juris Doctor and the Master of Business Administration degrees. The joint degree program is a response to a growing need for professionals trained in both fields. The increasing complexity of the law in the corporate, tax, and other business related fields has placed new demands upon the attorney, whether in private practice, on the corporate law staff of a firm, or in government work involving business and economic regulation. The combined degree program also provides a potent program of professional study for those who either contemplate or wish to be prepared for law-related and executive positions. The joint program provides both a complete program of legal education and graduate level training in business management. Visit the Academic Information section of this website for details of the MBA program.

Information concerning the University of Dayton School of Law and its academic programs is contained in the School of Law Bulletin which is available directly from the School of Law, Office of Admission and Financial Aid, 300 College Park, Dayton, Ohio 45469-1320, Phone 937-229-3555.

Communication (CAI) Interdisciplinary Program

James D. Robinson, Director of Graduate Studies

The Communication interdisciplinary study program leads to the Master of Arts. It requires 24 semester hours of study in communication, and 12 semester hours of study in one of several designated interdisciplinary areas. The designated areas are psychology, English, business, and political science. Upon completion of the coursework, students must pass a written and oral comprehensive exam. Visit the Academic Information section of this website for program details.

Electro-Optics (EOP)

Joseph W. Haus, Program Director

The programs of study for the Master of Science and Doctor of Philosophy in Electro-Optics are administered by the School of Engineering with the cooperative support of the College of Arts and Sciences. This interdisciplinary activity is coordinated by the Electro-Optics Program with active participation of the Electrical Engineering and Physics departments and the University of Dayton Research Institute. State-of-the-art graduate electro-optics courses have been designed to prepare electrical engineers and physicists for careers in the emerging electro-optics field. Facilities at the University include 25 laboratories used for electro-optics research. There is also close research cooperation with the Air Force Research Laboratory. Visit the Academic Information section of this website for program details.

International Marian Research Institute (IMRI)

Johann G. Roten, S. M., Program Director

To facilitate and encourage Marian Studies in the United States and abroad, the International Marian Research Institute (IMRI) was founded in 1975 at the

University of Dayton in affiliation with the Roman Pontifical Theological Faculty Marianum. Housed in the Marian Library, IMRI offers annual graduate-level summer schools on a three-year cycle to promote the programs of Marian Studies established by the Marianium. World-renowned theologians often join the faculty as guest instructors or lecturers.

Through IMRI, students can work toward a Pontifical Licentiate of Sacred Theology (S.T.L.) or Doctorate of Sacred Theology (S.T.D.)-each with specialization in Mariology-a certificate in Marian Studies, or a master's degree in religious studies with specialization in Mariology from the University's Department of Religious Studies, offered in a joint program. Course offerings include studies in Mariology, Christology, ecclesiology, spirituality, and theological anthropology.

Recognized as one of the world's leading centers for Mariological studies, the International Marian Research Institute also is committed to scholarly Marian research and the promotion of Marian art.

Admission is approved by the director of IMRI and an advisory council.

Teacher Education (EDT) Interdisciplinary Program

Kathryn Kinnucan-Welsch, Chair, Department of Teacher Education

The Department of Teacher Education in the School of Education and Allied Professions offers an opportunity for students to develop an individually designed program that includes coursework in education as well as a discipline or field outside of education. Students develop a plan through a selection of offerings in teacher education and other departments. Visit the Academic Information section of this website for program details.

For more information on any of these programs, visit the Academic Information section of this website, or consult with the program director or chair of the department.

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Five-Year Accelerated Programs

Electrical and Computer Engineering

An accelerated bachelors and master's degree program is available in electrical and computer engineering. Undergraduate majors in electrical and computer engineering with a grade point average of 3.25 or better may apply for the program during the second semester of their junior year. They take two graduate level courses in place of non-design technical electives during their fourth year, completing the remaining 24 hours of graduate credit in the fifth year. Students applying to the accelerated program are eligible for graduate scholarships, teaching or research assistantships and DAGSI scholarships, once they have completed their undergraduate degree requirements.

Accounting and MBA

Modification in accountancy laws in most states, including Ohio, require completion of a 150 hour program for eligibility to be licensed as a Certified Public Accountant. A combined B.S. degree in accounting with the MBA degree is available to meet accountancy requirements in Ohio and other states. Students applying to the combined program take MBA core courses plus appropriate accounting or other electives in their final senior semester. Students complete the combined program requirements in consultation with their faculty advisors, chair of the Department of Accounting, and MBA program director.

Communication

A five-year B.A.+M.A. program in communication is also available. Communication majors maintaining a 3.2 overall GPA are invited to apply during their junior year. Students accepted into the program will take 2 graduate courses during their senior year. These six credits will count toward their M.A. degree as well as toward their BA degree. Contact the Director of Graduate Studies in the Department of Communication at 229-2028 for further information about the program.

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College of Arts and Sciences

Mary E. Morton, Dean
Donald J. Pozella, Associate Dean
Paul Benson, Associate Dean
Mary Brown, Associate Dean

The objectives of graduate work in the College of Arts and Sciences coincide with the general aims and philosophy of education that characterize the University of Dayton.

Programs leading to the Master of Arts or the Master of Science are offered in biology, chemistry, communication, English, mathematics, pastoral ministries, psychology, and theological studies. The Department of Computer Science offers the Master of Computer Science. The Master of Public Administration is also offered through the Department of Political Science.

The Department of Physics, as part of the Center for Electro-Optics, offers graduate courses in support of the Master of Science and the Doctorate of Philosophy in Electro-Optics. The Doctor of Philosophy degree is also offered by the Department of Biology and the Department of Religious Studies.

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School of Business Administration

Patricia Meyers, Dean
Paul Sweeney, Associate Dean for Graduate Programs and Faculty Development
Janice Glynn, Director, MBA Program
Jeffrey Carter, Assistant Director, MBA Program

Tel. 937-229-3733
Web site: http://www.sba.udayton.edu/mba

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Mission

The School of Business Administration offers an MBA curriculum that is multidisciplinary, integrative and flexible. The faculty and administrators in collaboration with the local business community believe that developing technologies, globalization, and workforce diversity have created a demand for change in higher education. Thus, UD has created an MBA program that includes an integrated core curriculum in which each course is built upon business themes rather than single business disciplines, better preparing students to solve complex business problems that straddle functional boundaries.

The mission of the Master of Business Administration (MBA) program is to develop students' business knowledge and skills to address critical business issues faced by enterprises. Through integrated and multidisciplinary educational experiences that place significant emphasis on critical thinking, our graduates become excellent candidates for key leadership roles within their organizations.

The MBA program develops graduates who have:

- An in-depth understanding of the functional areas of business
- An understanding of functional integration in the business enterprise
- An ability to visualize and conceptualize business opportunities, and provide effective leadership in pursuit of those opportunities
- An understanding of the relations between the firm and its stakeholders as well as balancing their needs
- An understanding of a commitment to ethical decision making

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Accreditation

The University of Dayton's business programs, undergraduate, accounting and MBA, are fully accredited by the most rigorous accrediting body for business education programs, AACSB International - the Association to Advance Collegiate Schools of Business.

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Individual Research

Students who have an interest in doing an in-depth study of a particular business topic can elect individual research with the approval of a faculty advisor. Individual research can qualify for one to six semester hours of credit; most studies are three semester hours. Typically, a student may take MBA 695 when 12 core hours (after foundation requirements) have been met.

Approval is obtained by completing a project proposal form, available online or from the MBA office. A student works with a faculty member to agree on a topic and a project proposal. The faculty advisor and the MBA director review and approve the proposal prior to registration. The student is expected to maintain close contact with the faculty member who will provide guidance and evaluation. Individual research projects are to be completed within one term.

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Transfer Credit

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A maximum of six semester hours of appropriate graduate credit earned at another accredited graduate school may be applied toward the post-foundation requirements of the MBA Program at the University of Dayton. This transfer credit may be applied if the student graduates from the UD MBA Program within a maximum of seven years from the date such courses were completed.

In some cases, the credit will have been completed at another university prior to matriculation in the MBA Program. To transfer this credit, a letter of request must be initiated by the student and sent with course descriptions to the MBA office. Official transcripts must accompany the letter. The request should be initiated during the first term of enrollment. If approved, the credit will be transferred upon completion of nine semester hours of UD MBA coursework and if the student is in good academic standing.

In other cases, a student, having started the UD MBA Program, will seek to transfer credit from another university to satisfy academic requirements. In these cases, the student must obtain approval for transfer credit for the course(s) prior to enrollment. The catalog descriptions or syllabi of the intended course(s) should be submitted to the MBA office. Consultation with an MBA advisor is also recommended. After course approval and completion, official transcripts are required. Transfer credit coursework must be of "B" quality or better. Quality points are not transferred.

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MBA Multilateral Transfer Agreement

The University of Dayton is a member of a select group of AACSB-accredited AJCU business schools who have jointly agreed to a special transfer arrangement. A student may transfer up to half of the post-Foundation coursework to another MBA program at one of these universities. These programs are located in many major cities such as Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, Milwaukee, New Orleans, Portland, St. Louis, San Diego, San Francisco, Santa Clara, Scranton, and Spokane. Please contact the MBA office for up-to-date information about the specific universities and the guidelines of this special transfer agreement.

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The faculty of the University of Dayton School of Business Administration is committed to a rigorous learning environment which challenges MBA students to achieve high levels of performance. This environment fosters the development of mature business skills and abilities in students.

The design and orientation of courses differ depending, among other factors, on the level of the course. Foundation courses provide a curricular knowledge; they may be more basic and less experiential than the higher level courses. Core and elective courses expand students' knowledge and enhance their abilities to apply this knowledge. For these courses, the faculty pursues various avenues of pedagogy that advance students' understanding of business situations. Students are exposed to the relevant concepts, thought, and theory in each course. The faculty complements and reinforces this material through applications and experiences which engage students as active participants in the learning process. These may take the form of student teams, case analyses, simulations, projects, or other methods of learning.

The faculty maintains high expectations of itself and students. In creating and maintaining a climate of challenge, the faculty requires students to demonstrate significant academic achievement. The faculty communicates these expectations to students early in each semester by setting high, realistic goals, which are reinforced in the classroom. The faculty then carefully evaluates student performance in light of these objectives, and may use the full range of grades to evaluate student performance. The efforts to establish and maintain a rigorous climate vis-à-vis grading standards are fully supported by the School of Business Administration. A 3.0 average must be attained and is required for graduation. Grading is based on a point system in which corresponding letter and quality points are:

A Excellent (4.000 quality points)
A- (3.6667 quality points)
B+ (3.3333 quality points)
B Average (3 quality points)
B- (2.6667 quality points)
C Poor (2 quality points)
F Failure (0 quality points)

If an "F" grade is received in a foundation, Integrated Core, or Capstone course, the student must repeat the course and achieve a passing grade. Both the original grade and the new grade are computed in the cumulative grade point average.

Withdrawal "W" Grade
During the fall and winter terms, a student may withdraw from a full-semester course without record during approximately the first three weeks of the term. During the accelerated summer sessions, withdrawal without record may take place during approximately the first two weeks. Thereafter, a student in a full-semester course may withdraw with record through approximately the eleventh week of a regular term or the fourth week of a summer session. Refer to the Graduate Composite for the specific dates. For half-semester courses, contact the MBA office.

Incomplete "I" Grade
A student in good standing in a course may, after the official withdrawal deadline (refer to the Graduate Composite for the specific date), petition to the professor for an "I" grade. This grade is appropriate if conditions beyond the control of the

student have led to an inability to complete all the course requirements. The professor may assign this grade if the reasons presented by the student are deemed acceptable, the student has completed a sufficient amount of coursework to justify this grade in anticipation of completion of the work, and the professor and student agree to a time-phased plan of action for completing the coursework.

The additional coursework must be completed and graded by the end of the following regular (non-summer) term in order for the professor to assign a letter grade. If the coursework is not completed by this date, or the professor has not yet submitted a final course grade, the "I" is automatically converted to an "F", thereby lowering the cumulative grade point average.

Audit "X" Grade
The "X" grade indicates that the student has registered to audit the course. No credit hours or quality points are awarded. Any course taken for audit may not be retaken at a later date for credit. Therefore, a course required for graduation may not be audited.

No Grade "N" Grade
The "N" grade indicates that no grade was reported by the instructor. Questions should be directed to the instructor.

Academic Probation
A student will be placed on probationary academic status if his or her cumulative grade point average is below 3.0 after completing nine or more semester hours of graduate credit. While on probation, a student may not transfer core, capstone, or elective credit from another university or college and may not receive financial assistance administered by the School of Business Administration.

A student on academic probation whose cumulative grade point average reaches 3.0 or better within the following nine semester hours of graduate credit is returned to good standing. Except under extraordinary circumstances, upon completion of these additional nine semester hours of graduate credit, a student will be dismissed if the cumulative grade point average continually remains below 3.0. A student who has returned to good academic standing, but whose grade point average subsequently is below 3.0 will be again placed on academic probation. A student returning to academic probation will be permitted to complete up to an additional nine semester hours of graduate credit in order to return to good standing, provided the student does not exceed nine semester hours beyond initial degree requirements and is eligible to graduate within the five-year limit for post-foundation credits. Failing this, the student will be dismissed.

Grade Appeals
A grade appeal may be initiated, provided that initiation is within 30 days following the start of the next term, and provided further that one of the following three criteria is met:

1. That the grade received appears to be inconsistent with the performance of the work required and recorded for that course;
2. The grade is inconsistent with what has been recorded for the course;
3. The grade received was explicitly determined by criteria other than the stated criteria system for that course.

The appeal process is initiated by consulting directly with the faculty member involved. If agreement is not reached, the appeal may be submitted in writing by the student to the department chairperson(s) with fully supporting facts and documentation for review.

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Financial Assistance

Graduate Assistantships

Graduate Assistantships allow students the opportunity to pursue an MBA degree at a full-time pace. Graduate Assistants work in an academic department in exchange for part or all of their tuition. Graduate Assistants also receive a stipend. A typical Graduate Assistant will work 20 hours a week. If you are interested in applying for a Graduate Assistant position, please contact the MBA office at (937) 229-3733 or visit the MBA website at www.sba.udayton.edu/mba.

The usual appointment is for a period of nine months. Renewal may be awarded for a second year, contingent upon satisfactory performance. Assistantships are limited each year; therefore, competition is keen. Students are not eligible for initiation or continuation of financial assistance administered by the School of Business Administration while on academic probation.

Dean's Fellowships

A limited number of Dean's Fellowships are available each term. To apply, the student submits an application and a statement to the MBA director emphasizing factors that would support and merit the award of the fellowship. Criteria for the award include program qualifications, academic records, personal goals and objectives, and financial need. Students may reapply each term. Applications are available at the website www.sba.udayton.edu/mba.

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Each semester a "Certificate for Outstanding Academic Achievement" is awarded to those graduating students who have achieved a GPA of 3.8 or higher. The certificates are mailed to the students approximately one month following graduation.

The Reverend Raymond A. Roesch, S.M., Award of Excellence for outstanding academic achievement is awarded each May to the MBA graduate from the preceding year who, based on the judgment of the faculty, has demonstrated the highest level of academic achievement and contributions in his or her MBA program. The award consists of a plaque which is presented to the student plus an engraved plate displayed in the School of Business.

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School of Education and Allied Professions

Thomas J. Lasley, II, Dean
C. Daniel Raisch, Associate Dean
Roberta B. Weaver, Associate Dean

The basic mission of the graduate programs in the School of Education & Allied Professions (SOEAP) is to prepare competent and compassionate professionals in several fields. Specifically, the mission is to prepare teachers and administrative leaders, exercise scientists, and human service specialists. The School is further committed to preparing scholar-practitioners at the Ph.D. level in the area of educational leadership. The SOEAP programs leading to graduate degrees are designed primarily to meet the following purposes:

1. To develop advanced proficiency in early, middle, and secondary school teachers who have completed recognized baccalaureate teacher education programs.
2. To enable individuals to qualify for licensure as principals and superintendents.
3. To prepare school counselors; school psychologists who will be working in state, county, local school systems; and counselors who will work in community and other agency settings to be highly competent and exemplary in their chosen profession.
4. To develop personnel for student services in higher education.
5. To prepare educational research specialists.
6. To enable students with nonprofessional education baccalaureate degrees and above-average academic records to gain teacher licensure.
7. To prepare leaders in the fields of exercise science and physical education.

In implementing these graduate programs, faculty members are committed to help students:

- understand the knowledge base that integrates their field of interest
- apply their knowledge base to practice
- value the relationship of theory to practice
- reflect mindfully upon professional practice
- value community and collaboration
- appreciate the moral dimensions of their work
- commit themselves to improving the quality of life within schools and the larger community

In working to address the mission, faculty and staff members in all departments endeavor to:

- create a supportive environment for learning
- respond to individual students' program needs
- draw upon the knowledge base of their field in providing quality instruction
- maintain high academic standards
- provide students the opportunity to choose a research or a practice emphasis in their academic program
- contribute to the knowledge base of their field
- assist the community in translating the knowledge base of their field to everyday practice
- serve as responsible social critics
- demonstrate collaborative teaching and inquiry behaviors
- engage in professional activity focused on the improvement of school

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and community life

Most graduate programs lead to the Master of Science in Education and Allied Professions degree. Other degree programs include the Educational Specialist degree and the Ph.D. in Educational Leadership.

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Authorization

The University of Dayton's graduate offerings leading to the Master of Science in Education and Allied Professions degree have the official approval of the State of Ohio Department of Education and of the National Council for the Accreditation of Teacher Education, and of the North Central Association.

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Assistantships

The School of Education & Allied Professions offers a limited number of assistantships. For information about these assistantships, contact the associate deans' office in Chaminade Hall Room 104.

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Evaluation Information

Students wishing to have transcripts evaluated for a licensure, endorsement, or validation program need to go on-line to the application website and make official application to the University of Dayton Graduate School of Education and Allied Professions. An official transcript(s) must be submitted. After the application and transcript(s) have been received, a report will be generated to Dr. Mary Lou Andrews listing names of students needing the evaluation. Dr. Andrews will complete the transcript review. A check sheet will then be sent to students showing which requirements they have already met and which courses they still need to take. After the transcript review has been completed, students can make an appointment to meet with an advisor. There is no charge to make application. The website is: http://gradadmission.udayton.edu

Academic Standing

To qualify for graduation, a student must achieve a grade point average of at least 3.0 (B) in all work undertaken toward the degree.

Employed Graduate Students

The maximum course load permitted for any graduate student who is fully employed is six semester hours for the first and second terms and for the first half of the third term. Adjustments to this policy are made on an individual basis in the case of applicants who are not employed or employed part-time.

Workshop Credit

No more than six semester hours of workshop credit may be applied toward a degree; assuming the course work is appropriate to the program.

Registration Dates For Courses At Off-Campus Sites

Students taking graduate courses at off-campus sites should note that registration dates for courses at these sites are different from the registration date for courses taken at the University of Dayton campus.

"I" and "P" Grades

The "I" grade may stand for a period of no more than one year from the end of the term in which the grade was assigned. If the grade is unchanged after one year, it becomes permanent and the course must be retaken.

The "P" grade may stand for a period of no more than two years from the end of the term in which the grade was assigned. If the grade is unchanged after two years, it becomes permanent and the course must be retaken.

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School of Engineering

Joseph Saliba, Dean
Donald Moon, Associate Dean, Graduate Engineering Programs and Research

The School of Engineering offers programs leading to master's and doctoral degrees in various areas of engineering. These graduate programs permit both departmental and interdisciplinary study to meet the specialized and continuing educational needs of the engineer. Sufficient flexibility allows the student to specialize or pursue a broad field of study. Current graduate programs in the School of Engineering lead to the following degrees:

Master of Science

- Major in Aerospace Engineering
- Major in Chemical Engineering
- Major in Civil Engineering
- Major in Electrical Engineering
- Major in Electro-Optics
- Major in Engineering
- Major in Engineering Management
- Major in Engineering Mechanics
- Major in Materials Engineering
- Major in Mechanical Engineering
- Major in Management Science

Doctor of Engineering

- Major in Aerospace Engineering
- Major in Electrical Engineering
- Major in Materials Engineering
- Major in Mechanical Engineering

Doctor of Philosophy in Engineering

- Major in Aerospace Engineering
- Major in Electrical Engineering
- Major in Materials Engineering
- Major in Mechanical Engineering

Doctor of Philosophy in Electro-Optics

Programs and the courses appropriate to each of these degrees are described in Academic Information.

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Assistantships and Fellowships

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Master's Degree Requirements

Unclassified Status

Students anticipating acceptance into a degree-granting program may register for only six semester hours of graduate coursework without approval of the associate dean of graduate engineering programs and research. There is no guarantee that any hours taken before acceptance will count toward a degree. An application for graduate study should be submitted as soon as possible to ensure that courses taken are compatible with degree requirements. Performance in graduate courses taken before acceptance to a graduate program does not change admission requirements.

Advising

Each student accepted into a master's program is assigned an academic advisor. A change of academic advisor is permissible upon request of the student. The academic advisor shall be a member of the program faculty and be approved by the department chair or program director, and the associate dean of graduate engineering programs and research. The academic advisor will assist the student in preparing a plan of study.

Plan of Study

A student must complete a minimum of 30 semester hours of graduate work. The specific courses should be itemized and approved on a Plan of Study form to be submitted to the Office of Graduate Engineering Programs and Research, prior to registration for the tenth graduate semester hour (excluding transfer credits), or before registration for the third semester. It is the student's responsibility to obtain approval from the academic advisor for any changes made to the plan of study and to submit to the academic advisor all deletions and additions in writing before the fourth week of the student's final semester. The plan of study and any amendments must be approved by the student's academic advisor, the department chair or program director, and the associate dean of graduate engineering programs and research.

Transfer of Credit

Up to six semester hours, or the equivalent, of graduate studies outside the University of Dayton may be accepted toward the master's degree. The transfer credit must be of B or higher grade level, cannot have been used to satisfy the requirements of an undergraduate degree, and must be verified by an official transcript from the granting institution. It is the responsibility of the student to have the transcript(s) sent to the Office for Graduate Admission and Processing.

Thesis

Each student whose plan of study requires a thesis must prepare it in accordance with the format outlined in *A Manual for the Preparation of Graduate Theses and Dissertations*, copies of which are available in the Office of Graduate Applications & Records, and in the Office of Graduate Engineering Programs and Research. The thesis must be based on the student's own work. Joint authorship is not permitted. The thesis advisor is responsible for supervising and approving the work, and assisting in forming the thesis committee and scheduling a defense. The thesis advisor may or may not be the academic advisor. The thesis defense may be either oral or written or both. The thesis must be presented to and approved by a committee of at least three members, at least two of whom are on the graduate faculty. The committee must

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receive the thesis at least one week prior to an oral defense. No student shall be allowed to defend the thesis more than twice.

A pass/fail grade will be assigned to the quality of the work. A final approved copy of the thesis is due in the Office of Graduate Engineering Programs and Research no later than one week before graduation.

Academic Standards

Master's degree students are required to maintain a minimum cumulative grade point average of a B (3.0) in coursework, with no more than six semester hours of C. Grades received from a thesis are Pass/Fail, and do not count toward the minimum grade point average of 3.0. Students who fail to meet these standards are placed on academic probation or dismissed from the program.

Time Limit

All requirements for a master's degree must be satisfied within seven calendar years from the time of matriculation.

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Accelerated Master's Program

University of Dayton students who have demonstrated above-average scholastic achievement during their first three years of undergraduate work are eligible to participate in an accelerated program leading to a master's degree. The student may take graduate courses that satisfy master's degree requirements while finishing the bachelor's degree. All other School of Engineering and department/program requirements apply to the accelerated master's program. Undergraduate students who are interested in this program should contact their department chair.

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Any other specific requirements and sequences are described in Academic Information or in departmental and program documents.

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The School of Engineering offers programs leading to the Doctor of Philosophy (Ph.D.) in engineering and in electro-optics, and Doctor of Engineering (D.E.). The programs leading to the Ph.D. in engineering and D.E. degrees encompass major fields of study in aerospace engineering, electrical engineering, materials engineering, and mechanical engineering.

Doctor of Philosophy (Ph.D.)

The Ph.D. is granted in recognition of superior achievement in independent research and coursework. The research must demonstrate that the student possesses the capacity for original thought, talent for research, and ability to organize and present findings.

The minimum credit hours required for the Ph.D. degree are 60 semester hours beyond the master's degree. This includes a minimum of 30 semester hours for the dissertation and a minimum of 30 semester hours of course-work. A student seeking the Ph.D. is required to complete a minimum of six semester hours in advanced mathematics.

The dissertation must either add to the fundamental knowledge of the field or provide a new and better interpretation of facts already known. It is expected to result in one or more manuscripts suitable for publication in a refereed journal.

Doctor of Engineering (D.E.)

The D.E. is granted in recognition of superior achievement in coursework and an independent project. The project will usually be broad in scope, involve more than one discipline or subdiscipline, and be closely tied to an industrial application.

A minimum of 60 semester hours beyond the master's degree is required for the D.E. degree. This includes a minimum of 21 semester hours for the dissertation and a minimum of 39 semester hours of coursework. A student seeking the D.E. is required to complete a minimum of 21 semester hours in the major area (covering the domains of at least two subdisciplines), nine semester hours in advanced mathematics, and nine semester hours in a synergistic area of engineering or science.

The dissertation must address an integrated industrial project. It is expected to result in a manuscript suitable for publication in an applied engineering journal and/or to documentation leading to a patent.

Temporary Advisor

Immediately upon admission into the doctoral program, a student will be assigned a temporary advisor. This temporary advisor will assist the student in the initial selection of courses for the first semester of enrollment.

Doctoral Advisory Committee

Before the end of the first enrolled semester, the student, in consultation with the department chair or program director, selects a major professor to serve as the chair of the doctoral advisory committee. The chair of the doctoral advisory committee will be a member of the graduate faculty. An advisory committee consisting of the chair and at least two other graduate faculty members from the programs of the School of Engineering will then be recommended for approval to the department chair or program director and to the associate dean of graduate

engineering programs and research. Appointment of one additional member of the committee from outside the student's program (i.e., other university faculty, adjunct professors, prominent researchers in industry or government) is required. One additional graduate faculty member may be appointed by the associate dean of graduate engineering programs and research. The composition of the committee will generally reflect the student's area of study and research interest. The duties of the doctoral advisory committee include advising the student, assisting the student in preparing the program of study, administering and reporting the candidacy examination, assisting in planning and conducting research, approving the dissertation, and conducting and reporting the results of the dissertation defense. A dissertation advisor other than the chair of the doctoral advisory committee may be appointed by the doctoral advisory committee.

Plan of Study

The plan of study shall include all the specific courses beyond the master's degree that the student is required to complete. The plan shall indicate the time and manner in which these requirements will be met. It is to be completed and approved by the doctoral advisory committee, the department chair or program director, and the associate dean of graduate engineering programs and research, before the end of the second semester of the student's enrollment.

Residency Requirement

After admittance to a doctoral program, the student must complete the residency requirements to be considered for the candidacy examination. This requirement must be met by completing 21 semester hours of graduate coursework in four or fewer consecutive semesters which may or may not include the summer.

Candidacy Examination

The candidacy examination for the doctoral degree is generally taken when most of the coursework, as outlined on the approved plan of study, has been completed. Its purpose is to determine the student's eligibility to become a candidate for the doctoral degree. It will include two parts: (1) a written and an oral examination covering the domain of coursework; and (2) an oral examination on the dissertation proposal. Part 2 must be completed within six months of the completion of part 1. At the discretion of the doctoral advisory committee, the part 2 examination can be taken simultaneously with the oral portion of the part 1 examination.

The proposal outlining in detail the proposed area of dissertation research should clearly show the review of the literature in the area, the need for and the uniqueness of the research, the general approach, expected results, the laboratories and/or other facilities needed, and a schedule of work. No more than six semester hours of dissertation can be taken prior to successful presentation of the dissertation proposal. The student must make a copy of this proposal available to each doctoral advisory committee member at least one week prior to the Part 2 examination.

The student must pass all parts of the examination to be admitted to candidacy. The student is considered to have passed only when the decision of the doctoral advisory committee is unanimous. All members must sign the examination report form with an indication of their decision noted prior to its being submitted to the associate dean of graduate engineering programs and research. If any part of the examination is unsatisfactory, the student will be notified in writing of the conditions for another examination. No student will be permitted to take any part of the examination more than twice. A second examination may not be given earlier than four months after the submission of the examination report.

A student must pass the candidacy examination at least six months prior to the dissertation defense.

Dissertation

A single author dissertation is required of each doctoral candidate who has passed the candidacy exami-nation. The dissertation topic will be selected by the student in consultation with the advisor and the doctoral advisory committee. The dissertation topic must be approved by the doctoral advisory committee. The dissertation must be prepared in accordance with the instructions outlined in *A Manual for the Preparation of Graduate Theses and Dissertations*, copies of

which are available in the Office of Graduate Engineering Programs & Research or the Office of Graduate Applications & Records. A manuscript prepared for an appropriate journal and an acknowledgment of receipt by the editor must also be submitted along with the dissertation.

The student must obtain approval from the doctoral advisory committee to undertake all or part of the dissertation in absentia. A letter requesting such permission, signed by the chair of the doctoral advisory committee, must be submitted to the associate dean of graduate engineering programs and research. This letter should outline in detail the relationship between the advisor and the candidate and the name and background of the person who will directly advise the candidate during the accomplishment of this independent research. This person will be added to the advisory committee.

The dissertation, three copies of the dissertation in final form, the journal manuscript and acknowledgment of receipt by the editor, and an abstract not to exceed 350 words must be submitted to the office of Graduate Engineering Programs & Research at least three weeks before the graduation date of the semester in which the degree is sought. These copies must bear the written approval of the advisor. The original copy of the dissertation will be filed in the Roesch Library. All doctoral dissertations are microfilmed by University Microfilms, Inc., Ann Arbor, Michigan. The candidate must sign an agreement with University Microfilms, Inc., which authorizes this firm to sell copies of the dissertation. Microfilmed dissertations may be copyrighted by the candidate. A fee will be assessed for the cost of copyrights.

Dissertation Defense

No earlier than six months after the successful candidacy examination, the candidate shall defend the doctoral dissertation in a public forum to demonstrate to the committee that all the preparation for which the doctoral degree is awarded has been met. The defense is open to all members of the University of Dayton faculty, student body, and interested outside parties. The members of the doctoral advisory committee, with the advisor acting as chair, will conduct this dissertation defense.

Before the announcement of this defense, the doctoral advisory committee must agree that the dissertation is ready for public defense. At least two weeks prior to the date of the defense, the candidate must provide the committee with copies of the nearly final dissertation and must ask the associate dean of graduate engineering programs and research to schedule the defense. For the defense to be satisfactory, the advisory committee members must agree that the dissertation defense has been successfully completed. If the candidate's defense is deemed unsatisfactory by only one member, the case will be referred to the associate dean of the graduate engineering program and research for appropriate action.

Additional Requirements

The student must satisfactorily complete the courses listed in the doctoral plan of study with a 3.0/4.0 or better cumulative GPA. One grade of "F" or more than one grade of "C" may be grounds for dismissal from the program pending recommendation of the doctoral advisory committee. Grades received from a dissertation are Pass/Fail, and do not count toward the GPA.

Two thirds of the semester hours required beyond the master's degree should be earned at the University of Dayton. Generally, this is 48 semester hours beyond the master's degree.

Candidates must be registered for a minimum of two semester hours every semester during their candidacy including the semester in which the dissertation is defended. Students are expected to complete the dissertation requirements for the doctoral degree within five years after the candidacy examination has been passed.

Any other specific requirements and sequences leading to these degrees are described in the following sections or in departmental and program documents.

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Assistant to the Associate Vice President of Athletics	Christine Kraft
Associate Director of Athletics/Director of Compliance/Senior Woman Administrator	Cindy Hartmann
Coordinator for Compliance & Eligibility	Julie Steinke
Associate Director of Athletics/Director of Athletic Performance	Joe Owens
Associate Director of Athletics/Director of UD Arena & Arena Sports Complex	Tim O'Connell
Assistant Director of Athletics	James Brothers
Assistant Director of Athletics/Frericks Ctr. Equipment	Ken Keck
Academic Counselor	Elizabeth Flach
Academic Counselor	Vera Gomes
Sports Information Director	Doug Hauschild
Athletics Communications Department	Bill Thomas, Kevin Wilkinson
Strength & Conditioning Coach	Mark Thobe
Director of Corporate Sales & Development	Todd Muckerheide

Director of Men's Basketball Season Tickets	Gary McCans
Athletics Business Manager	Dawn Mamula
Assistant Athletics Business Manager	Margaret Gantt
Head Baseball Coach	Tony Vittorio
Assistant Coach	Todd Linklater
Men's Head Basketball Coach	Brian Gregory
Assistant Coaches	Bob Beyer, Reggie Rankin, Billy Schmidt
Basketball Operations Coordinator	Lance Surridge
Women's Head Basketball Coach	Jim Jabir
Assistant Coaches	Susan Blauser, Melanie Halker, Bernard Scott
Basketball Operations Coordinator	Frank Goldsberry
Basketball Strength & Conditioning Coach	Mike Bewley
Men's Cross Country Coach	Rich Davis
Women's Cross Country Coach/Assistant	Ann Alyanak
Women's Track & Field Coach	
Women's Track & Field Coach	Kandice Erwin
Head Football Coach	Mike Kelly
Assistant Coaches	Dave Whilding, Rick Chamberlin, Chris Ochs
Men's & Women's Head Golf Coach	Drew Tyrer
Women's Asst Golf Coach	Sally Kosters
Men's Head Soccer Coach	Dennis Currier
Assistant Coaches	Nick Glaser, Paul Souders
Women's Head Soccer Coach	Mike Tucker
Assistant Coaches	Amy Berbary, Sergio Gonzalez
Head Softball Coach	Jodi Eickemeyer
Assistant Coach	Ali Brian
Men's Tennis Coach	Steve Brumbaugh
Women's Tennis Coach	Erica Echko
Head Volleyball Coach	Tim Horsmon
Assistant Coaches	Jason Oliver, Tami Ores
Head Trainer	Steve Foster
Associate Head Trainer	Nate Seymour
Assistant Trainers	Sara Thomas, Kaname Yamaguchi
Equipment & Awards Manager	Tony Caruso
Director of Development for Intercollegiate Athletics	Dave Harper
Faculty Athletics Representative	J. Michael O'Hare, Ph.D.

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Arts and Sciences Graduate Faculty

ABUEIDA,Atif (2000), Mathematics, Assistant Professor-B.S.,United Arab Emirates University, 1987; M.S., East Tennesee State University, 1995; Ph.D. Auburn University, 2000.

AHERN, David W. (1977), Political Science, Professor-B.A., Southern Connecticut State College, 1970; M.A., University of Maryland, 1972; Ph.D., 1976.

ALEXANDER, Roberta S. (1969), History, Professor-A.B., University of California at Los Angeles, 1964; M.A., University of Chicago, 1966; Ph.D., 1974.

BARDINE, Bryan. (2001), English, Assistant Professor-B.A., University of Dayton, 1990; M.A., University of Dayton, 1993; Ph.D., Kent State University 2004.

BARNES, Michael H. (1968), Religious Studies, Professor-A.B., St. Louis University, 1961; Ph.L., 1962; Ph.D., Marquette University, 1976.

BENIN, Vladimir A. (2001), Chemistry, Assistant Professor-V.S., University of Sofia, 1990, M.S. Vanderbilt University, 1993; Ph.D., 1995.

BERNEY, Rex L. (1978), Physics, Associate Professor-B.S., University of Missouri at Columbia, 1971; M.S., 1973; Ph.D., 1978.

BIERS, David W. (1976), Psychology, Associate Professor-B.A., Lafayette College, 1966; M.S., Northwestern University, 1968; Ph.D., 1970.

BOEHNLEIN, James (1992), English, Associate Professor-B.A., University of Dayton, 1973; M.A., University of Dayton, 1988; Ph.D. Miami University 1992.

BOWER,Samuel M. (1965), Psychology, Associate Professor - B.A., Mexico City College, 1957; Ph.D., Vanderbilt University, 1963.

BRANICK, Vincent P. (1979), Arts and Sciences, Professor-B.A., Chaminade College of Honolulu, 1963- M.A., Catholic University of America, 1964; S.T.B., University of Fribourg, 1966; S.T.L., 1969, D.Phil., 1971; S.S. L., Pontifical Biblical Institute, Rome, 1972; Drs. Gregorian University, Rome, 1972; SS.D., Pontifical Biblical Institute, Rome, 1975.

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BOWMAN, Connie L. (1997), Teacher Education, Associate Professor-B.A., Capital University, 1975; M.Ed., University of Cincinnati, 1981; Ph.D., The Ohio State University, 1995.

BRAHLER, Jayne C. (2000), Health & Sport Science, Assistant Professor-B.S., Montana State University, 1980; M.S., Washington State University, 1993; Ph.D., Washington State University, 1998.

COLLOPY, Rachel M. B. (2005), Teacher Education, Assistant Professor-B.A., Smith College, 1987; M.A., University of Michigan, Ann Arbor, 1993; Ph.D., University of Michigan, Ann Arbor, 1999.

DAPRANO, Corrine (2001), Health & Sport Science, Assistant Professor-B.A., Cleveland State University, 1985; M.Ed., Cleveland State University, 1994; Ph.D., The Ohio State University, 2001.

DeLUCA, Barbara M. (1975), Educational Leadership, Associate Professor-B.S., University of Dayton, 1971; M.Ed., Miami University,1975; Ph.D., The Ohio State University, 1984.

DeMARCO, Jr. George M. (1997), Health and Sport Science, Associate Professor-B.S., Bridgewater State College, 1978; M.S., Ithaca College, 1992; Ed.D., University of Georgia, 1998.

DEMMITT, Alan D. (1995), Counselor Education and Human Services, Assistant Professor-B.S., M.A., Northeast Louisiana University, 1991; Ph.D. Iowa State University, 1994.

DOLAN, Patricia E. (1999), Health and Sport Science, Assistant Professor-B.S., University of Cincinnati,1979; M.S., University of Dayton, 1991.

FERGUSON, Susan (1998), Teacher Education, Administrative Faculty-B.S., University of Dayton, 1975; M.S., University of Dayton, 1982.

HALL, Scott E. (1995), Counselor Education and Human Services, Assistant Professor-B.S., Western Carolina University, 1985; M.Ed., Ohio University, 1991; Ph.D., The Ohio State University, 1994.

HART, Patricia M. (1989), Teacher Education, Assistant Dean for Program Development-B.S., University of Dayton, 1973; M.S., 1983; Ph.D., The Ohio State University, 1989.

HERRELKO, Janet M. (1999), Teacher Education, Associate Professor-B.A., Regis College, 1970; M.A., University of Maryland, 1971; Ed.D., University of Massachusetts Lowell, 1996.

HUNLEY, Sawyer A. (1999), Counselor Education and Human Services, Assistant Professor-B.S., Miami University, 1976; Ed.S., Miami University, 1988; Ph.D., University of Cincinnati, 1998.

HUNN, Diana M. (1992), Teacher Education, Associate Professor- B.S., Miami University, 1972; M.Ed., 1973; Ph.D., Indiana University, 1986.
HUNT, Thomas C. (1996), Professor - B.A., Loras College, 1952; M.A., The Catholic University of America, 1956; Ph.D., University of Wisconsin (Madison), 1971.
ILG, Timothy J. (1998), Educational Leadership, Associate Professor-B.S., Malone College, 1968; M.A., The Ohio State University, 1972; Ph.D., The Ohio State University, 1982.
ISRAEL, Susan (2003), Teacher Education, Assistant Professor-B.S., St. Joseph's College, 1985; M.S., Indiana University, 1998; Ph.D., Ball State University, 2002.
JOSEPH, Ellis A. (1961), Teacher Education, Professor Emeritus-A.B., University of Notre Dame, 1955; M.A., 1956; Ph.D., 1962; L.H.D. (Honorary), College of Mt. St. Joseph, 1989.
KELLY, Mary K. (2005), Teacher Education, Assistant Professor-B.A., College of St. Benedict, 1987; B.S. University of Minnesota, 1990; M.Ed., Miami University, 1996; Ph.D., Miami University, 2001.
KINNUCAN-WELSCH, Kathryn A. (1997) Teacher Education, Chair and Associate Professor-B.S., University of Illinois, 1971; M.A., Western Michigan University, 1988; Ed.D., Western Michigan University, 1995.
KOWALSKI, Theodore J. (2000), Educational Leadership, Kuntz Chair in Education and Professor- B.S., Indiana State University, 1965; M.S., Indiana State University, 1968; Ph.D., Indiana State University, 1971.
LASLEY, Thomas J., II (1983), Teacher Education, Dean-B.S., The Ohio State University, 1969; M.A., 1972; Ph.D., 1978.
LAUBACH, Lloyd L. (1980), Health and Sport Science, Chair and Associate Professor -B.S., Central State University, Edmond, Oklahoma, 1961; M.S., University of Oregon, 1962; Ph.D., The Ohio State University, 1970.
LAWLESS FRANK, Catherine M. (2003), Teacher Education, Clinical Faculty- B.S., University of Dayton, 1990; M.S., University of Dayton, 1997; Ed.D., University of Cincinnati, 2004.
LINDERMAN, Jon K. (2000), Health & Sport Science, Assistant Professor-B.A., California State University, Chico, 1994; M.A., California State University, Chico, 1987; Ph.D., University of California, Berkley, 1991.
LEWELLYN, Beth (2003), Teacher Education, Clinical Faculty-B.S., Miami University, 1972; M.A. Wright State University, 1988; Ph.D., Miami University, 2003.
MASSUCCI, Joseph D. (1983), Educational Leadership, Chair and Associate Professor- B.A., St. John Vianney Seminary, 1970; M.A., Catholic University of America, 1977; Ed.S., University of Dayton/Wright State, 1988; Ph.D., University of Dayton, 1993.
MATHES, Connie (1998), Teacher Education, Administrative Faculty-B.A., Wright State University, 1973; M.Ed., Wright State University, 1980.
MORRISON, Julie (2003), Counselor Education and Human Services, Assistant Professor-B.S., St. Louis University, 1992; M.A., Xavier University, 1994; M.Ed., University of Cincinnati, 1997; Ph.D., University of Cincinnati, 2001.
MOULIN, Eugene K. (1968), Counselor Education and Human Services, Professor-B.A., Mount Union College, 1956; M.E., Kent State University, 1959; Ph.D., University of Toledo, 1968.
MULLINS, Monalisa (2002), Teacher Education, Lecturer-B.A., St. Leo College, 1985; M.A., University of Dayton, 1987; Ph.D., University of Dayton, 2003.
OBERLANDER, Judith (1987), Teacher Education, Administrative Faculty- B.A.,University of Dayton 1969; M.S., University of Dayton,1987;Ph.D., University of Dayton, 2002.
OLDENSKI, Thomas E., S.M. (1994), Educational Leadership, Associate Professor, - B.S., The University of Dayton, 1972; M.Ed., Boston College, 1975; M.A., Western Michigan University, 1978; Ed.S., The University of Dayton, 1984; Ph.D., Miami University (Ohio), 1994.
OBERLANDER, Judith N. (1987), Teacher Education, Administrative Faculty- B.A., University of Dayton, 1969; M.S.Ed., University of Dayton, 1987; Ph.D., University of Dayton, 2002.
PLACE, A. William (1994), Educational Leadership, Associate Professor-B.S., University of Dayton, 1976; M.S., 1980; Ph.D., The Ohio State University, 1988.
POLANSKI, Patricia J. (1998), Counselor Education and Human

Services, Assistant Professor-B.A., University of Akron, 1979; M.Ed., Ohio University, 1987; Ph.D., University of North Carolina at Greensboro, 1998.
RAISCH, C. Daniel (1991), Educational Leadership, Associate Dean for Administration-B.S., Wilmington College, 1961; M.A., Wittenberg University, 1966; Ph.D., Miami University, 1973.
RHODES. Angel R. (2005), Counselor Education and Human Services, Assistant Professor-B.A., The Ohio State University, 1993; M.S.,University of Dayton, 1996
RICHARDS, Stephen (2000), Teacher Education, Associate Professor-B.A., University of North Carolina, 1976; M.A., East Carolina University, 1979; Ed.D., Florida Atlantic University, 1990.
RIDENOUR, Carolyn R. (1990), Educational Leadership, Professor-B.A., Indiana University, 1964; M.A., 1967; Ed.D., University of Akron, 1980.
ROWLEY, James B. (1989), Teacher Education, Professor-B.S., University of Dayton, 1969; M.Env., Miami University, 1975; Ph.D., The Ohio State University, 1989.
RUETH, Thomas W. (1987), Counselor Education and Human Services, Chair and Associate Professor-B.S., University of Dayton, 1963; M.A., 1968, Ph.D., Loyola University, 1973.
RUSSO, Charles J. (1996), Educational Leadership, Panzer Chair in Education and Professor - B.A., St. John's University, 1972; M. Div., Seminary of Immaculate Conception, 1978; J.D., St. John's, 1983; Ed.D., 1989.
SCHALLER, Molly (2001), Counselor Education & Human Services, Assistant Professor-B.A. The Ohio State University, 1987; M.S., Miami University, Ohio, 1989; Ph.D., Ohio University, 1999.
SIMMONS, A. Llewellyn (2002), Educational Leadership, Assistant Professor-B.A., Plymouth State College of the University of New Hampshire, 1981; M.Ed., Howard University, 1991; Ph.D., Miami University, 2002.
TALBERT-JOHNSON, Carolyn (1991), Teacher Education, Professor-B.A., Ohio Dominican College, 1976; M.A., The Ohio State University, 1978; Ph.D., 1991.
TIEMAN, Phillip (2001), Educational Leadership, Administrator in Residence- B.S., The Ohio State University; M.Ed., University of Cincinnati; Ph.D., The Ohio State University, 1968.
TILLMAN, Beverly A. (1990), Teacher Education, Associate Professor, - B.S., Miami University (Ohio), 1974; M.A., The University of Michigan, 1975; Ph.D., The Ohio State University, 1992.
TITLEBAUM, Peter J. (2001), Health and Sport Science, Associate Professor-B.S., The State University of New York at Brockport, 1982; M.S., The Ohio State University, 1985; Ed.D., Temple University, 1993.
TWALE, Darla J. (1998), Counselor Education and Human Services, Professor-B.A., Geneva College, 1973; M.A., Duquesne University, 1976; M.A., University of Pittsburgh, 1980; Ph.D., University of Pittsburgh, 1985.
WATRAS, Joseph (1979), Teacher Education, Professor-B.A., Boston University, 1965; M.Ed., University of Hawaii, 1969; Ph.D., The Ohio State University, 1972.
WEAVER, Roberta B. (1978), Teacher Education, Associate Dean for Outreach-B.Sc. in Ed., The Ohio State University, 1960; M.Sc., in Ed., University of Cincinnati, 1966; Ed.D., 1982.
ZAHNER, Mary A. (1982), Teacher Education, Professor-B.F.A., Ohio University, 1960; M.A., 1969; Ph.D., The Ohio State University, 1987.

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Engineering Graduate Faculty

ALTMAN, Aaron (2002), Mechanical & Aerospace Engineering, Assistant Professor- B.S.M.E., Tulane University, 1990; M.S., University of Texas at Austin, 1994; Ph.D., Cranfield (England), 2001.

BALLAL, Dilip R. (1994), Mechanical and Aerospace Engineering, Hans von Ohain Distinguished Professor-B.Sc. M.E., College of Engineering, Bhopal, India, 1967; M.Sc. M.E. Cranfield Institute of Technology, England, 1968; Ph.D., 1972.

BANERJEE, Partha (2000), Electrical and Computer Engineering, Professor-B. Tech., Indian Institute of Technology, 1979; M.S., University of Iowa, 1980; Ph.D., 1983.

BOGNER, Fred K. (1969), Civil and Environmental Engineering and Engineering Mechanics, Professor Emeritus -B.S.C.E., Case Institute of Technology, 1961; M.S.E. Mech., Case Institute of Technology, 1964; Ph.D., 1967.

BROWNING, Charles E., (2005), Chemical & Materials Engineering, Professor and Torley Chair in Composite Materials - B.S., West Virgina University, 1966; M.S. Wright State University, 1970; Ph.D., University of Dayton, 1976.

BROCKMAN, Robert A. (1984), Civil and Environmental Engineering and Engineering Mechanics and Mechanical & Aerospace Engineering, Professor-B.S.M.E., Carnegie-Mellon University, 1973; M.M.E., University of Dayton, 1974; Ph.D., 1979.

CAMBEROS, Jose (1995), Mechanical & Aerospace Engineering, Adjunct Professor - B.S., University of California, 1987, M.S., Stanford University, 1989; Ph.D., 1995.

CHASE, Donald V. (1993), Civil and Environmental Engineering and Engineering Mechanics, Lecturer - B.S., University of Kentucky, 1985; M.S. 1989; Ph.D., 1993; Reg. Prof. Engr.

CHATTERJEE, Monish (2002), Electrical and Computer Engineering, Professor - B. Tech., Indian Institute of Technology, 1979; M.S., University of Iowa, 1982; Ph.D., University of Iowa, 1985.

CHUANG, Henry N. (1965), Mechanical and Aerospace Engineering, Professor Emeritus-B.S., National Taiwan University, 1958; M.S., University of Maryland, 1962; Ph.D., Carnegie Institute of Technology, 1966. Reg. Prof. Engr.

CIRIC, Amy R. (2001), Chemical and Materials Engineering, Lecturer-B.S. CHE and B.A., Carnegie-Mellon University, 1985; Ph.D., Princeton University, 1990.

DAI, Liming (2004), Chemical & Materials Engineering, Professor and WBI Endowed Chair in Nano Materials-BSc., Polymer Science & Engineering, Zhejiang University, China, 1983; Phd., Chemistry Australian National University, Australia, 1991.

DANIELS, Malcolm W. (1987), Electrical and Computer Engineering, Assistant Professor-B.S., University of Strathclyde, 1979; Ph.D.,1982.

DEEP, Ronald (1989), Engineering Management and Systems. Associate Professor-B.S., U.S. Air Force Academy, 1960; M.S.E., Purdue University, 1970; Ph.D., Florida State University, 1976; Reg. Prof. Engr.

DONALDSON, Steven L. (2001), Civil and Environmental Engineering, Assistant Professor - B.S. Purdue Unversity, 1981; University of Dayton, 1987;Ph.D., Standford University, 1993.

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DOYLE, George R. (1982), Mechanical and Aerospace Engineering, Professor-B.S., Purdue University, 1965; M.S., 1967; Ph.D., University of Akron, 1973., Reg. Prof. Engr.

DUNCAN, Bradley D. (1991), Electrical and Computer Engineering and Electro-Optics, Professor - B.S.E.E., Virginia Polytechnic Institute and State University, 1986; M.S., 1988; Ph.D., 1991.

EASTEP, Franklin E. (1980), Aerospace Engineering, Professor Emeritus-B.S., The Ohio State University, 1958; M.S., Air Force Institute of Technology, 1963; Ph.D., Stanford University, 1968.

EBELING, Charles E. (1988), Engineering Management and Systems, Professor-B.S., University of Pittsburgh, 1965; M.S., Air Force Institute of Technology, 1969; Ph.D., The Ohio State University, 1973; Reg. Prof. Engr.

EIMERMACHER, John P. (1986), Mechanical and Aerospace Engineering, Professor- M.E., University of Cincinnati, 1963; M.S.M.E., 1967; Ph.D., 1973. Reg. Prof. Engr.

ERVIN, Jamie (1994), Mechanical and Aerospace Engineering, Professor-B.S.M.E., Michigan Tech. University, 1984; M.S.M.E., 1986; Ph.D., University of Michigan, 1991.

EYLON, Daniel, (1987), Materials Engineering, Professor-B.Sc., Technion, Israel Institute of Technology, 1966; M.Sc., 1968; D.Sc., 1972.

FARHEY, Daniel (2000), Civil and Environmental Engineering and Engineering Mechanics, Assistant Professor-B.Sc., Technion, Haifa, Israel, 1983; M.Sc., 1986; D.Sc. 1991.

FITZ, Raymond L., S.M. (1969), Electrical Engineering and Engineering Management, Professor-B.E.E., University of Dayton, 1964; M.S., Polytechnic Institute of Brooklyn, 1967; Ph.D., 1970.

FLACH, Lawrance (1989), Chemical Engineering, Professor - B.Sc., Chemical Engineering, University of Cape Town, South Africa, 1980; M.Sc., 1982; Ph.D., University of Colorado at Boulder, 1989.

FRICK, Roy K. (1987), Engineering Management and Systems, Professor Emeritus-B.S., Clemson University, 1950; M.S., The Ohio State University, 1966; Ph.D., 1970; Reg. Prof. Engr.

GALLAGHER, Joseph P. (1981), Materials Engineering, Professor-B.Sc.E., Drexel University, 1964; M.S., University of Illinois, 1965; Ph.D., 1968.

HALLINAN, Kevin P. (1988), Mechanical and Aerospace Engineering, Professor-B.S. University of Akron, 1982; M.S. Purdue University, 1984; Ph.D., Johns Hopkins University, 1988.

HARDIE, Russell C. (1993), Electrical and Computer Engineering, Professor - B.E.S. Loyola College, 1988; M.E.E., University of Delaware, 1990; Ph.D., 1992.

HAUS, Joseph (1999), Electro-Optics Program, Professor-B.S., John Carroll University, 1971; M.S., 1972; Ph.D., Catholic University of America, 1975.

HECHT, Norman L. (1963), Materials Engineering, Professor Emeritus-B.S. Ceramic Engineering, Alfred University, 1960; M.S. Ceramic Science, State University of New York, 1968; Ph.D. , 1972.

JAIN, Vinod K. (1979), Mechanical and Aerospace Engineering, Professor-B. S.M .E., University of Roorkee, India, 1964; M.S.M.E., 1970; Ph.D., Iowa State University of Science and Technology, 1980.

JOHN, Reji (1993), Materials Engineering, Associate Professor - B. Tech., Indian Institute of Technology, India, 1982; Ph.D., Northwestern University, 1988.

JOHNSON, Jay (2001), Chemical and Materials Engineering, Assistant Professor, B.S. Miami University, 1971; M.S., Wright State University, 1976; Ph.D., University of Cincinnati, 1981.

KASHANI, A. Reza (1994), Mechanical and Aerospace Engineering, Professor- B.Sc., Sharif University of Technology, 1977; M.Sc., University of Wisconsin-Madison, 1979; Ph.D., 1989.

KISSOCK, John Kelly (1995), Mechanical and Aerospace Engineering, Associate Professor- B.S.M.E., University of Colorado, 1982; M.S., Washington University, 1989; Ph.D., Texas A&M University, 1993.

KLOSTERMAN, Donald A. (1999), Chemical and Materials Engineering, Adjunct Assistant Professor-B.S., University of Dayton, 1989; M.S., 1991; Ph.D., 1994.

KUMAR, Binod (1980), Materials Engineering, Associate Professor, (1993) Electro-Optics, Associate Professor- B.S., Banaras Hindu University, India, 1967; M.S., Penn State University, 1973; Ph.D., 1976.

LAFDI, Khalid (2003), Materials Engineering and Mechanical & Aerospace Engineering, Professor- B.S. Chem.Eng. (France), 1986; M.S. Chem. Eng. , 1987; Ph.D. 1989; D.Sc. 1991.

LEE, C. William (1982), Chemical Engineering, Professor-B.S., National Taiwan University, 1976; M.S., University of Akron, 1979; Ph.D., The Ohio State University, 1982.

LIU, Shiqiang (1990), Materials Engineering, Professor - B.S., University of Science and Technology, Beijing, 1967; M.S., 1980; Ph.D., University of Dayton, 1989.

LITKO, Joseph R. (2002), Engineering Management & Systems, Associate Professor - B.S., Illinois Institute of Technology; M.S., Air Force Institute of Technology, 1982; Ph.D., The Ohio State University, 1985.

LOOMIS, John S. (1979), Electrical & Computer Engineering, Associate Professor-B.S., Case Institute of Technology, 1966; M.S., University of Illinois, 1968; M.S., University of Arizona, 1977; Ph.D., 1980.

LU, Chris C. (1976), Chemical Engineering, Professor Emeritus-B.S., Chen-Kung University at Taiwan, 1960; M.S., University of Missouri at Rolla, 1966; Ph.D., University of Texas, 1972.

MALHAS, Faris A. (2005), Civil and Environmental Engineering Mechanics, Professor - B.S. University of Michigan, 1977; MS CEE University of Michigan, 1978; MS E.Mech, University of Wisconsin-Madison, 1987; Ph.D. University of Wisconsin-Madison, 1988.

MEYENDORF, Norbert (2000), Materials Engineering, Professor-M.Sc., Halle-Wittenberg (Germany), 1976; Ph.D., 1980; Sc.D., 1986.

MOON, Donald L. (1979), Electrical and Computer Engineering, Professor-B.S.E.E., West Virginia Institute of Technology, 1963; M.S.E.E., University of Toledo, 1966; Ph.D., The Ohio State University, 1974.

MURRAY, Andrew P. (1997), Mechanical & Aerospace Engineering, Associate Professor-B.S., Rose-Hulman Institute, 1989; M.S., University of California, 1993; Ph.D., University of California, 1996.

MURRAY, Paul T. (1975), Materials Engineering, Professor-B.S. Chemistry, University of Cincinnati, 1974; Ph.D. Chemical Physics, University of North Carolina, 1979.

MYERS, Kevin J. (1986), Chemical Engineering, Professor-B.Ch.E., University of Dayton, 1981; D.Sc., Washington University, 1986; Reg. Prof. Engr.

MYKYTKA, Edward (1998), Engineering Management and Systems, Professor-B.S., University of Dayton, 1976; M.S., University of Iowa, 1978; Ph.D., University of Arizona, 1983.

ORDONEZ, Raul (2001), Electrical and Computer Engineering, Associate Professor - B.S., Monterrey Institute of Technology, Mexico, 1994; M.S., The Ohio State University, 1996; Ph.D., The Ohio State University, 1999.

PASALA, Krishna M. (1984), Electrical and Computer Engineering, Professor-B.E., Andhra University, India, 1970; Ph.D., Indian Institute of Science, Bangalore, 1974.

PEELER, Deborah (1995), Engineering Management and Systems, Adjunct Professor - B.S., Purdue University, 1977; M.S., University of Dayton, 1979; J.D., Salmon P. Chase College of Law, 1983; Ph.D., University of Dayton, 1993. Reg. Prof. Engr.

PENNO, Robert P. (1987), Electrical and Computer Engineering, Associate Professor - B.S.M.E., Rose Hulman Institute of Technology, 1971; M.S.E.E., 1984; Ph.D., University of Dayton, 1987.

PHILLIPS, Norman S. (1974), Engineering Mechanics, Professor-B.A.E., The Ohio State University, 1955; M.S.E., University of Dayton, 1968;

M.S.Ed., 1983; Reg. Prof. Engr.

PINNELL, Margaret F. (2003), Mechanical and Aerospace Engineering, Assistant Professor-B.S.M.E., University of Dayton, 1988; M.S. Mat. Engr., 1988; Ph.D., Mat. Engr., 1995.

SALIBA, Joseph (1980), Civil and Environmental Engineering and Engineering Mechanics, Professor-B.S., University of Dayton, 1979; M.S. 1980; Ph.D., 1983, Reg. Prof. Engr.

SALIBA, Tony E. (1986), Chemical Engineering, Professor-B.Ch.E., University of Dayton, 1981; M.S., 1982; Ph.D. 1986.

SANDERS, Brian P. (2005) Mechanical & Aerospace Engineering, Graduate Professor- B.S. University of Southern California, 1985; M.S., University of Dayton, 1987;Ph.D., Air Force Institute of Technology, 1993.

SANDHU, Sarwan S. (1980), Chemical Engineering, Professor - B.Sc., Panjab University, 1961; B.Sc.C.E., 1966; M.Sc., University of New Brunswick, 1970; D.I.C. Imperial College 1973; Ph.D., University of London, 1973.

SARANGAN, Andrew (2000), Electro-Optics Program, Associate Professor-B.S., University of Waterloo, Canada, 1991; M.S., 1993; Ph.D., 1997.

SARGENT, Gordon A. (1985), Mechanical and Aerospace Engineering, Professor-B.Sc., Imperial College of Science and Technology, University of London, 1960; Ph.D., 1964.

SATHISH, Shamachary (1995), Materials Engineering, Assistant Professor- B.Sc., University of Mysore, Bombay, 1974; M.Sc., 1976; Ph.D., 1986.

SCARPINO, Frank A. (1987), Electrical and Computer Engineering, Professor- B.S.E.E., University of Cincinnati, 1963; M.S.E.E., 1970; Ph.D., University of Dayton, 1987.

SCHAUER, John J. (1968), Mechanical and Aerospace Engineering, Professor-B.M.E., University of Dayton, 1958; M.S., Carnegie Institute of Technology, 1959; Ph.D., Stanford University, 1964.

SIDHU, Sukh (1992), Mechanical & Aerospace Engineering, Associate Professor-B.S., Osmania University, 1987; Ph.D., University of Illinois, 1992.

SMARI, Waleed (2000), Electrical & Computer Engineering, Associate Professor-B.S., Syracuse University, 1978; M.S. (Electrical)., 1983; M.S. (Computer), 1990; Ph.D., 1996.

SNIDE, James A. (1979), Materials Engineering, Professor Emeritus-B.S.M.E., Ohio University, 1959; M.S., Air Force Institute of Technology, 1965; Ph.D., The Ohio State University, 1976.

SUBRAMANYAM, Guru (1998), Electrical & Computer Engineering, Associate Professor - B.E., University of Madras, India, 1984; M.S., University of Cincinnati, 1988; Ph.D., University of Cincinnati, 1993.

SWEENEY, Patrick J. (1978), Engineering Management, Professor - B.S., University of Notre Dame, 1957; M.S., University of Missouri, 1967; Ph.D., University of Dayton, 1977; Reg. Prof. Engr.

TAYLOR, Philip H. (1988), Electro-Optics, Assistant Professor - B.S., State University College at Oneonta, 1980; Ph.D., Pennsylvania State University, 1984.

THIELE, Gary A. (1979), Electrical and Computer Engineering, Professor Emeritus-B.S., Purdue University, 1960; M.S., The Ohio State University, 1964; Ph.D., 1968.

TURNER, Michael L. (2001), Mechanical & Aerospace Engineering, Assistant Professor-B.S.M.E., University of Dayton, 1993; M.S., Stanford University, 1995; Ph.D., Stanford University, 2001.

ULLETT, Jill (1992), Materials Engineering, Adjunct Assistant Professor-B.S., University of Dayton, 1979; M.S., 1987; Ph.D., 1992.

VOEVODIN, Andrey A. (1998), Materials Engineering, Adjunct Professor - B.S. and M.S., Tula Polytechnical Institute, Russia, 1986; Ph.D., Tula State University, 1991, Russia.

WEBER, John (2001), Electrical & Computer Engineering, Professor -

B.S.E.E., St. Louis University, 1963, M.S.E.E., University of Missouri, 1964; Ph.D., University of Missouri, 1971.

WEEKS, Thomas M.. (1977), Aerospace Engineering, Adjunct Professor-B.S.M.E., Syracuse University, 1958; M.S.M.E., The Ohio State University, 1965; Ph.D., Syracuse University, 1965.

WHITNEY, James M. (1991), Civil and Environmental Engineering and Engineering Mechanics. Professor Emeritus -B.A. Sciences, Illinois College, 1959; MSTE, Georgia Institute of Technology, 1961; M.S. Engineering Mechanics, The Ohio State University, 1964; Ph.D., 1968.

WILKENS, Robert (1999), Chemical & Materials Engineering, Associate Professor - B.Cm.E., University of Dayton, 1992; M.S., 1993; Ph.D.,Ohio University, 1997.

WURST, John C. (1971), Mechanical and Aerospace Engineering, Professor Emeritus-B.M.E., University of Dayton, 1957; M.S.E., 1968; Ph.D., University of Illinois 1971; Reg. Prof. Engr.

ZABARNICK, Steve (2000), Mechanical & Aerospace Engineering, Professor-B.S., Binghamton University, 1980; Ph.D., Pennsylvania State, 1984.

ZHAN, Qiwen (2002), Electro-Optics Program, Associate Professor - B.S., University of Science and Technology of China, 1996; M.S., University of Minnesota, 2000; Ph.D., 2002.

ZOGHI, Manoochehr (1986), Civil Engineering and Engineering Mechanics, Associate Professor-B.S., University of Louisville, 1979; M.E., 1981; Ph.D., University of Cincinnati, 1988.

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School of Engineering

(AEE) Aerospace Engineering (Collapse Description)

Kevin P. Hallinan, Chair of the Department

Programs (Collapse All)

Program Name

Doctorate of Engineering in Aerospace Engineering (AEE)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Doctorate of Philosophy in Aerospace Engineering (AEE)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Master of Science in Aerospace Engineering (AEE)

The program of study leading to the Master of Science in aerospace engineering must include a minimum of 30 semester hours of credit consisting of the following:

1. Twelve semester hours in the major area. Major areas of study include aerodynamics, aircraft propulsion, and aircraft structures.
2. Twelve semester hours of core electives. Core electives will be selected from current course offerings that best satisfy the student's requirements and meet with the advisor's approval. At least one mathematics course is strongly recommended.
3. Six semester hours of research leading to a master's thesis. Research may be replaced by six semester hours of additional coursework with the approval of the advisor and the department chair.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the advisor.

Explore by Department:

Aerospace Engineering
Biology
Business Administration
Chemical Engineering

Explore

Explore by Program:

Adolescence to Young Adult Educatio... (EDT)
Aerospace Engineering (AEE)
Applied Mathematics (MAS)
Art Education (MSE.EAR) (EDT)

Explore

Explore by Courses:

Aerospace Engineering (AEE)
Biology (BIO)
Business Administration (MBA)
Chemical Engineering (CME)

Explore

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
AEE 500	INTRODUCTION TO NUMERICAL METHODS	3

Numerical analysis topics include the solution of systems of linear and nonlinear algebraic equations; matrix eigenvalue problems; ordinary differential equations; optimization techniques; numerical integration and interpolation. Engineering applications presented. Computer programming required.

Code	Title	Sem. Hrs.
AEE 501	ADVANCED AERODYNAMICS I	3

Fundamentals of aerodynamics including viscosity and compressibility phenomena for subsonic, supersonic, and transonic flow. Emphasis on force and moment determination for bodies, including theory of lift.

AEE 502 ADVANCED AERODYNAMICS II 3

Advanced analytical development of compressible aerodynamics as applied to lifting surfaces and slender bodies. Approximations to lifting surface theory and numerical solution. Introduction to unsteady aerodynamics.
Prerequisite(s): AEE 501.

AEE 503 INTRODUCTION TO CONTINUUM MECHANICS 3

Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics.
Prerequisite(s): EGM 303.

AEE 504 FUNDAMENTALS OF FLUID MECHANICS 3

An advanced course in fluid mechanics with emphasis on the derivation of conservation equations and the application of constitutive theory. Navier-Stokes equations. Ideal fluid approximation. Exact and approximate solutions to classical viscous and inviscid problems. Compressible and incompressible flows.
Corequisite(s): MEE 503 or AEE 503.

AEE 505 ADVANCED AEROSPACE SYSTEMS DESIGN AND INTEGRATION 3

Considers iterative aircraft design process through to preliminary design. A project based course, specific topics will vary but will apply to cutting edge aerospace systems integration and design problems. Students will take a set of requirements from conceptual design through to preliminary design, analysis, component testing, and integration on a systems level.
Prerequisite(s): (MEE 425 or equivalent) or permission of instructor.

AEE 506 MECHANICAL BEHAVIOR OF MATERIALS 3

Fudamental relationships between the struture and mechanical behavior of materials. Includes fundamentals of stress and strain, the physical basis for elastic deformation, elementary dislocation theory and plastic deformation, strengthening mechanisms, yield criteria and their application to biaxial and multi-axial behavior and failure, fracture and toughening mechanisms, creep and creep rupture,behavior and failure of cellualr solids, and fatigue.
Prerequisite(s): (MAT 501, 502) or consent of instructor.

AEE 507 ORBITAL DYNAMICS 3

Solution of the two-body problem; coordinate systems; time measurement; orbital elements. Basic orbital maneuvers; transfers; rendezvous; ground-tracks. Methods of orbit determination. Restricted three-body problem and introduction to artificial satellite theory.
Prerequisite(s): (MTH 219; EGM 202) or equivalent.

AEE 508 AIRCRAFT PERFORMANCE AND CONTROL 3

Elementary development of aircraft equations of motion; performance in level flight; climbing and descending performance; turning performance; takeoff and landing performance; static stability and control in all three axes.
Prerequisite(s): AEE 501.

AEE 510 INTRODUCTION TO THE FINITE ELEMENT METHOD 3

Introductory development of the Finite Element Method (FEM), and solution of one- and two-dimensional field problems from fluid, solid, and thermal mechanics. Principles of virtual work and Hamilton; approximate methods; description of stiffness, nodal force, and mass matrices; matrix assembly procedures. Course emphasis on a broad understanding of FEM theory and applications. Not open to Aircraft Structures majors.
Prerequisite(s): EGM 303.

AEE 513 PROPULSION 3

Principles of propulsive devices, aerothermodynamics diffuser and nozzle flow, energy transfer in turbo-machinery, turbojet, turbo-fan, prop-fan engines, turbo-prop and turboshaft engines. RAM and SCRAM jet analysis and a brief introduction to related materials and air frame-propulsion interaction.
Prerequisite(s): MEE 418.

AEE 514 SMART STRUCTURES AND MATERIALS OVERVIEW 3

Physical Gas Dynamics: The basic elements of kinetic theory, chemical thermodynamics, and statistical mechanics. Emphasis is placed on the application of these molecular theories for analyzing thermodynamic and transport phenomena, as they pertain to the modeling of "real gas effects" in high temperature flows. The course assumes material media in local equilibrium in the gaseous state but some non-equilibrium behavior will also be considered. The equilibrium topics include kinetic theory and concepts related to microscopic, molecular collisions, macroscopic chemical thermodynamics, the law of mass action, internal molecular structure and quantum energy states, general statistical mechanics applied to the prediction of thermodynamic properties of monatomic and diatomic gases, chemically reacting mixtures, and the dissociation and ionization of gases. **Prerequisite(s):** BAckgrund in fluid mechanics, thermodynamics, and compressible flow or instuctor's consent.

AEE 515 CONDUCTION HEAT TRANSFER 3

Steady state and transient state conduction. Evaluation of temperature fields by formal mathematics, numerical analysis. Emphasis on approximate solution techniques.

AEE 516 CONVECTION HEAT AND MASS TRANSFER 3

Development of governing differential equations for convection. Methods of solution including similarity methods, integral methods, superposition of solutions, eigenvalue problems. Turbulent flow convection; integral methods, eddy diffusivities for heat and momentum. Extensions to mass transfer. **Prerequisite(s):** MEE 410.

AEE 517 RADIATION HEAT TRANSFER 3

Fundamental relationships of radiation heat transfer. Radiation characteristics of surfaces. Geometric considerations in radiation exchange between surfaces. Emissivity and absorptivity of gases. Introduction to radiative exchange in gases.

AEE 519 ANALYTICAL DYNAMICS 3

Dynamical analysis of a system of particles and rigid bodies. Lagrangian and Hamiltonian formulation of equations of motion; classical integrals of motion. Stability analysis of linear and nonlinear systems.
Prerequisite(s): (MTH 219; EGM 202) or equivalent.

AEE 520 THEORETICAL KINETMATICS 3

Introduction to the mathematical theory underlying the analysis of general spatial motion. Analysis of mechanical systems including robots, mechanisms, walking machines and mechanical hands using linear algebra, quaternion and screw formulations. Fundamental concepts include forward and inverse kinematics, workspace, Jacobians, and singularities.

AEE 521 FLIGHT VEHICLE DYNAMICS 3

Dynamics of flight vehicles that emphasize the fundamental theory of flight and its application to aerospace systems. Static and dynamic stability including the characteristic longitudinal and lateral perturbation motions about the equilibrium state.
Prerequisite(s): AEE 501.

AEE 522 GEOMETRIC METHODS IN KINEMATICS 3

Trajectories and velocities of moving bodies are designed and analyzed via the principles of classical differential and algebraic geometry. Fundamentals include centrodes, instantaneous invariants, resultants and center point design curves. Curves, surfaces, metrics, manifolds and geodesics in spaces of more than three dimensions are analyzed to study multi-parameter systems.

AEE 523 ENGINEERING DESIGN OPTIMIZATION 3

An introduction to the theory and algorithms of nonlinear optimization with an emphasis on applied engineering problems. Fundamentals include Newton's method, line searches, trust regions, convergence rates, and linear programming. Advanced topics include penalty, barrier and interior-point

methods.

AEE 527 AUTOMATIC CONTROL THEORY 3

Stability and performance of automatic control systems. Classical methods of analysis including transfer functions, time-domain solutions, root locus and frequency response methods. Modern control theory techniques including state variable analysis, transformation to companion forms, controllability, pole placement, observability and observer systems.
Prerequisite(s): ELE 432 or MEE 435 or equivalent.

AEE 535 MECHANICAL VIBRATIONS 3

Review of undamped, damped, natural and forced vibrations of one and two degrees of freedom systems. Lagrange's equation, eigenvalue/eigenvector problems, modal analysis for discrete and continuous systems. Computer application for multi-degree of freedom, nonlinear problems.
Prerequisite(s): MEE 319; computer programming.

AEE 536 RANDOM VIBRATIONS 3

Introduction to probability distribution; characterization of random vibrations; harmonic analysis; auto- and cross-correlation and spectral density; coherence; response to single and multiple loadings; Fast Fourier Transform (FFT); applications in vibrations, vehicle dynamics, fatigue, etc.
Prerequisite(s): MEE 319; computer programming.

AEE 538 INTRODUCTION TO AEROELASTICITY 3

The study of the effect of aerodynamic forces on a flexible aircraft. Flexibility coefficients and natural modes of vibration. Quasi-steady aerodynamics. Static aeroelastic problems; wing divergence and dynamic aeroelasticity; wing flutter. An introduction to structural stability augmentation with controls.
Prerequisite(s): AEE 501.

AEE 541 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3

Introduction to the mechanical response of fiber-reinforced composite materials with emphasis on the development of experimental methodology. Analytical topics include stress-strain behavior of an isotropic materials, laminate mechanics, and strength analysis. Theoretical models are applied to the analysis of experimental techniques used to characterize composite materials. Lectures are supplemented by laboratory sessions in which characterization tests are performed on contemporary composites.
Prerequisite(s): EGM 303 or 330.

AEE 543 ANALYTICAL MECHANICS OF COMPOSITE MATERIALS 3

Analytical models are developed to predict the mechanical and thermal behavior of fiber-reinforced composite materials as a function of constituent material properties. Both continuous and discontinuous fiber-reinforced systems are considered. Specific topics include basic mechanics of an isotropic materials, micromechanics, lamination theory, free-edge effects, and failure criteria.
Prerequisite(s): EGM 303 or 330.

AEE 544 MECHANICS OF COMPOSITE STRUCTURES 3

Comprehensive treatment of laminated beams, plates, and sandwich structures. Effect of heterogeneity and anisotropy on bending under lateral loads, buckling, and free vibration are emphasized. Shear deformation and other higher order theories and their range of parametric application are also considered.
Prerequisite(s): MAT 543 or permission of instructor.

AEE 545 COMPUTATIONAL METHODS FOR DESIGN 3

Modeling of mechanical systems and structures, analysis by analytical and numerical methods, development of mechanical design criteria and principles of optimum design. Selected topics in mechanical design and analysis, use of the digital computer as an aid in the design of mechanical elements.
Prerequisite(s): Computer programming.

AEE 546 FINITE ELEMENT ANALYSIS I 3

Fundamental development of the Finite Element Methods (FEM) and solution to field and comprehensive structural problems. Variational principles and weak-forms; finite element discretization; shape functions; finite elements for field problems; bar, beam, plate, and shell elements; isoparametric finite elements, stiffness, nodal force, and mass matrices; matrix assembly procedures; computer coding techniques; modeling decisions; program output interpretation. Course emphasis on a thorough understanding of FEM theory and modeling techniques.
Prerequisite(s): AEE 503 or MEE 533.

AEE 547 FINITE ELEMENT ANALYSIS II 3

Advanced topics: heat transfer; transient dynamics; nonlinear analysis; substructuring and static condensation; effects of inexact numerical integration and element incompatibility; patch test; frontal solution techniques; selected topics from the recent literature.
Prerequisite(s): AEE 546.

AEE 551 NOISE AND VIBRATION CONTROL 3

Concepts of noise and vibration control applied to mechanical systems. Methodologies covered will include passive treatments using resistive elements (sound absorbers, vibration damping) and reactive elements (tailoring of material stiffness and mass); active control of sound and vibration; and numerical analysis.
Prerequisite(s): MEE 319 or 439.

AEE 552 BOUNDARY LAYER THEORY 3

Development of the Prandtl boundary layer approximation in two and three dimensions for both compressible and incompressible flows. Exact and approximate solutions for laminar flows. Unsteady boundary layers. Linear stability theory and transition to turbulence. Empirical and semi-empirical methods for turbulent boundary layers. Higher order boundary layer theory.
Prerequisite(s): AEE 504 or equivalent.

AEE 553 COMPRESSIBLE FLOW 3

Fundamental equations of compressible flow. Introduction to flow in two and three dimensions. Two-dimensional supersonic flow, small perturbation theory, method of characteristics, oblique shock theory. Introduction to unsteady one-dimensional motion and shock tube theory. Method of surface singularities.
Prerequisite(s): AEE 504 or equivalent.

AEE 555 TURBULENCE 3

Origin, evolution, and dynamics of fully turbulent flows. Description of statistical theory, spectral dynamics, and the energy cascade. Characteristics of wall-bounded and free turbulent shear flows. Reynolds stress models.
Prerequisite(s): AEE 504 or equivalent.

AEE 556 HYPERSONIC AERODYNAMICS 3

Hypersonic prediction techniques, similarity rules, Newtonian impact theory, high-temperature equilibrium properties of gases; wake characteristics; heat transfer, chemical kinetics and reacting gas flows, simulation and testing techniques.
Prerequisite(s): AEE 504 or permission of instructor.

AEE 558 COMPUTATIONAL FLUID DYNAMICS 3

Numerical solution to Navier-Stokes equations and approximations such as the boundary layer equations for air-flow about a slender body. Numerical techniques for the solution of the transonic small disturbance equations. Numerical determination of fluid instabilities.
Prerequisite(s): AEE 504 or permission of instructor.

AEE 560 PROPULSION SYSTEMS 3

Introduction and history, types of propulsion systems, thermodynamics review and simple cycle analysis, thermodynamics of high speed gas flow, aircraft gas turbine engine, parametric cycle analysis of various types of gas turbine engines, component and engine performance analysis (inter-turbine burners), advanced cycles with regeneration, reheating, and inter-cooling,

variable and inverse cycle engines, hybrid propulsion systems (turbo-ramjets, rocket-ram-scramjets, etc.), advanced propulsion systems, pulse detonation engine theory and concepts, thermal management of high-speed flight, energy management and vehicle synthesis.
Prerequisite(s): (MEE 413 or 513) or permission of instructor.

AEE 565 FUNDAMENTALS OF FUELS AND COMBUSTION 3

Heat of combustion and flame temperature calculations; rate of chemical reaction and Arrhenius relationship; theory of thermal explosions and concept of ignition delay and critical mass; phenomena associated with hydrocarbon-air combustion; specific applications of combustion.

AEE 566 COMBUSTION THEORY 3

Theory of detonation (Rankine-Hugoniot relationships) and flame propagation rates in pre-mixed gas systems; turbulent flames and the well-stirred reactor; theory of diffusion flames; fuel droplet combustion; steady burning of solid materials; ignition and flame spreading across solid materials.

AEE 570 FRACTURE MECHANICS 3

Application of the principles of fracture mechanics to problems associated with fatigue and fracture in engineering structures. The course will cover the development of models that apply to a range of materials, geometries and loading conditions.
Prerequisite(s): AEE 506 or permission of instructor.

AEE 580 AEROSPACE ENGINEERING PROJECT 3 - 6

Student participation in an aerospace research, design, or development project under the direction of a project advisor. The student must show satisfactory progress as determined by the project advisor and must present a written report at the conclusion of the project.

AEE 595 SPECIAL PROBLEMS IN AEROSPACE ENGINEERING 1 - 6

Special assignments in aerospace engineering subject matter to be approved by the student's faculty advisor and the program director.

AEE 599 THESIS 3 - 6

AEE 690 SELECTED READINGS IN AEROSPACE ENGINEERING 1 - 3

Directed readings in aerospace engineering to be arranged and approved by the student's advisory committee and the program director. May be repeated.

AEE 695 SPECIAL PROBLEMS IN AEROSPACE ENGINEERING 1 - 3

Special assignments in aerospace engineering. Subject matter to be arranged and approved by the student's advisory committee and the program director. May be repeated.

AEE 698 D.E. DISSERTATION 1 - 15

An original investigation as applied to aerospace engineering practice. Results must be of sufficient importance to merit publication.

AEE 699 Ph.D. DISSERTATION 1 - 15

Research in aerospace engineering. Results must be of sufficient importance to merit publication.

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College of Arts and Sciences

(BIO) Biology (Collapse Description)

Jayne B. Robinson, Department Chairperson
Shirley J. Wright, Graduate Program Director

The Department of Biology offers programs leading to the Master of Science and the Doctor of Philosophy. The degrees are in biology, but each program is tailored to the student's own interests and career plans. Specialization is accomplished by selection of courses, choice of thesis or dissertation topic, and participation in weekly seminars in the area of interest. The specific program is determined after consultation between the student and the advisory committee. The Department of Biology also offers a Master of Science program without a thesis requirement. Two major areas of specialization are available. These areas and the typical spectra of graduate courses available are as follows:

Environmental/Ecological Sciences

Field Biology
Microbial Ecology
Biochemistry
Molecular Biology
Community Ecology
Behavioral Ecology
Biometrics
Advanced Bioinformatics
Biochemical Genetics
Evolution and Development
Ecosystem Dynamics
Bioinstrumentation

Basic Biomedical Sciences

Advanced Developmental Biology
Biochemical Genetics
Immunology
Biochemistry
Advanced Bioinformatics
Biometrics
Advanced Microbiology
Advanced Cell Biology
Molecular Biology
Bioinstrumentation

Assistantships

Qualified applicants are eligible for financial assistance in the form of fellowships, traineeships, and research or teaching assistantships. Students admitted to the doctoral program are given priority for these awards. In addition to a stipend, all appointments with financial aid are exempt from tuition during both the academic year and the summer session. Financial aid is available during the summer on a competitive basis.

Advising

Each student is assigned a provisional advisor for assistance during the first semester. Prior to registration for the second semester each student selects a major professor, who will serve as director of the student's advisory committee. The composition of this committee is representative of the general field of study in which the student expects to work.

The committee helps to plan the student's entire program. The committee generally meets with the student twice a year to offer suggestions and assess progress in the program and thesis research.

Programs (Collapse All)

Program Name

Doctorate of Philosophy in Biology (BIO)

Each student is required to complete BIO 552-553, BIO 501, BIO 601 and two advanced courses by the end of the first year. Following completion of the first year, each doctoral student follows the program outlined by the advisory committee. In practice, most students find it helpful to take at least 30 semester hours of graduate course credits beyond the bachelor's degree in addition to 30 credit hours of dissertation research to attain the level of competence suitable for a doctoral candidate. All Ph.D. students who have not taken a biostatistics course as an undergraduate must enroll in BIO 550 (Biometrics). Individuals on teaching assistantships must complete the teaching seminar (BIO 503) and teach at least one laboratory course during their tenure in the program.

Residence Requirement

A student is strongly advised to devote as much time as possible to graduate studies. To satisfy the residency requirement, Ph.D. students must attend the University as a full-time student. The Ph.D. program is a full-time only program. If the advisory committee encourages attendance of a semester or a summer as a full-time student at a neighboring institution or in an off-campus research site, that time may be applied to the residence requirement.

Sequence of Evaluation

The program is centered on the development of professional competence. Each student is formally assessed in the following steps:

1. A qualifying examination at the beginning of the second year of full-time graduate study for all graduate students.
2. A candidacy examination over the area of specialization (Ph.D. students only); and
3. A defense of dissertation.

Each semester the graduate coordinating committee evaluates the overall performance of each student toward obtaining the degree. A student judged to be making unsatisfactory progress may be placed on probation or dismissed from the program. Further details concerning the policies of the graduate program can be found in the Manual for Graduate Studies in the Department of Biology at the University of Dayton.

Qualifying Examination

At the beginning of the second full year of graduate work, all Ph.D. students will take a qualifying examination. An important purpose of the examination is to aid the student's advisory committee in planning the remainder of the program. The examination will cover basic biological concepts, subject matter of graduate courses taken, and broad areas of the student's specialty. The emphasis will be not only on facts but on the student's command of self-expression, ability to reason, and to integrate knowledge.

Utilizing the student's performance in both the written and oral phases of the exam, the advisory committee makes an evaluation and suggests one of the following possible alternatives:

1. The student should continue to work toward completion of the Ph.D. degree.
2. The student should correct obvious deficiencies and retake the written and/or oral examination(s) - (retake must be scheduled no later than the middle of the next semester and result in a clear pass or fail/withdrawal from graduate work).
3. After consultation with the advisory committee, the student should switch to the M.S. program.
4. The student should withdraw from graduate work (student has failed the examination without an opportunity of a second chance).

All other graduate examinations come at specific times in the progress of the student's program and are scheduled and administered by the advisor and advisory committee. These examinations consist of the Ph.D. candidacy

examination, and the defense of the Ph.D. dissertation.

Ph.D. Candidacy Examination

The candidacy examination for Ph.D. students is administered by the advisory committee, which may be supplemented by members requested by the committee and/or the department chair. The examination will be taken no later than the end of the sixth semester for those entering the program with a B.S. or M.S. The purpose of the examination is to judge the student's competence in the special area and in related fields. Following the examination, the student may be directed to (a) complete the dissertation, (b) strengthen preparation by demonstrating competence in one or more areas, (c) withdraw from the Ph.D. program and complete a thesis M.S. degree, or (d) withdraw from the program. At the committee's discretion, additional competence in an area may be demonstrated by special examination or by completion of specific courses to the committee's satisfaction. The student is considered a candidate for the Ph.D. after successful completion of these requirements.

Defense of Dissertation

1. The examination on the Ph.D. dissertation will consist of a formal oral examination on the subject matter of the dissertation.
2. A Ph.D. student must present the dissertation for defense within five years after admission to candidacy.

Master of Science in Biology (BIO)

The M.S. degree requires 24 semester hours of coursework plus a research thesis. Each student is required to complete BIO 552-553, BIO 501, BIO 601 and two advanced courses by the end of the first year. All M.S. students who have not taken a biostatistics course as an undergraduate must enroll in BIO 550 (Biometrics). Individuals on teaching assistantships must complete the teaching seminar (BIO 503) and teach at least one laboratory course during their tenure in the program.

Students declaring the M.S. non-thesis option are required to complete 30 hours of coursework consisting of the aforementioned courses. A research paper is required, and the subject matter of the paper is determined by the advisory committee.

Residence Requirement

A student is strongly advised to devote as much time as possible to graduate studies. To satisfy the residency requirement, M.S. students must attend the University as a full-time student for at least one full year. If the advisory committee encourages attendance of a semester or a summer as a full-time student at a neighboring institution or in an off-campus research site, that time may be applied to the residence requirement.

Sequence of Evaluation

The program is centered on development of professional competence. Each student is formally assessed in the following steps:

1. A qualifying examination at the beginning of the second year of full-time graduate study for all graduate students; and
2. A defense of thesis.

Each semester the graduate coordinating committee evaluates the overall performance of each student toward obtaining the degree. A student judged to be making unsatisfactory progress may be placed on probation or dismissed from the program. Further details concerning the policies of the graduate program can be found in the Manual for Graduate Studies in the Department of Biology at the University of Dayton.

Qualifying Examination

At the beginning of the second full year of graduate work, all M.S. students will take a qualifying examination. An important purpose of the examination is to aid the student's committee in planning the remainder of the program. The examination will cover basic biological concepts, subject matter of graduate courses taken, and broad areas of the student's specialty. The emphasis will be not only on facts but on the student's command of self-expression, ability to reason, and to integrate knowledge.

Utilizing the student's performance in both the written and oral phases of the exam, the advisory committee makes an evaluation and suggests one of the following possible alternatives:

1. The student should continue to work toward completion of the M.S. degree.
2. The student should correct obvious deficiencies and retake the written and/or oral examination(s) - (retake must be scheduled no later than the middle of the next semester and result in a clear pass or fail/withdrawal from graduate work).
3. The student should withdraw from graduate work (student has failed the examination without an opportunity of a second chance).
4. M.S. students who show outstanding ability and wish to proceed toward the Ph.D. may be encouraged to stay at UD. They are required to pass the qualifying exam, present and defend an oral research progress report, and Ph.D. proposal to their advisory committee in their third semester of the program. The advisory committee will decide if the student shows sufficient ability to enter the Ph.D. program. Upon positive recommendation from the advisory committee, the student must submit a formal application for admission to the Ph.D. program to the Admissions Committee by the third week of their fourth semester of the program. The Admissions Committee will make the final recommendation regarding their acceptance. If accepted, the student must conform to all requirements of the Ph.D. program.
5. At the time of the qualifying exam, both the student and advisory committee have the final opportunity to review the choice of the M.S. program - thesis or non-thesis option. For the non-thesis option, the nature of the requirements should be specified by the advisory committee. If under unusual circumstances, a student wishes to change options after this date and the advisory committee concurs, it should be recognized that this may result in an additional semester or more of work. However, consideration should be given to the availability of support for continuation of a M.S. program beyond two years.

Students who choose to complete a Master's degree are considered candidates for that degree after the qualifying examination. A student who wishes to continue beyond the Master's degree will be advised to continue for the doctorate (see requirements above) or to terminate his/her studies at the university on the basis of his/her performance in earning the Master's degree.

All other graduate examinations come at specific times in the progress of the student's program and are scheduled and administered by the advisor and advisory committee. These examinations consist of the defense of M.S. thesis and the final M.S. non-thesis program exam.

Defense of Thesis

1. The examination on the M.S. thesis will consist of a formal oral examination on the subject matter of the thesis.
2. For students electing the non-thesis option, an oral examination is held over the subject matter of the research paper.
3. All those working toward the master's degree must complete the program within five years after admission to the program.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
BIO 501	SEMINAR	0

Presentation of biological research data by faculty members and visiting scientists. Required of all graduate students each semester.

Code	Title	Sem. Hrs.
BIO 503	COLLEGE TEACHING SEMINAR	1

To assist graduate teaching assistants in acquiring information, understanding, and skills seen as important components of effective teaching.

Code	Title	Sem. Hrs.
BIO 505	MICROBIAL ECOLOGY	3

Study of the diversity of microorganisms and the interrelationships between microorganisms and their environments. Emphasis is placed on aquatic ecosystems.

BIO 505L MICROBIAL ECOLOGY LABORATORY 1

Examination of the methods of isolation and enumeration of microorganisms and techniques for determining their activities in the field and laboratory.

BIO 511 ECOSYSTEM DYNAMICS 3

An advanced course examining ecosystem structure and function. Emphasis on community level interactions, applied ecology and the ways in which ecosystem biodiversity can be influenced by the biotic and abiotic forces of the environment, including the global impact of the human species.

BIO 521 BIOCHEMICAL GENETICS 2

An analysis of the nature of the gene and gene action. Particular attention will be given to genetic control of protein synthesis and recent advances in biochemical and physiological genetics. Two hours lecture.

BIO 522 IMMUNOLOGY 3

Study of innate and acquired immunity, cells and organs of the immune system, antigens and immunoglobulins. Specific emphasis on the organization and expression of immunoglobulin genes; genetic restriction; cytokines and immune regulation including hypersensitivity, immune tolerance, transplantation and autoimmunity. Biochemistry recommended.

BIO 523 ADVANCED MICROBIOLOGY 3

Lectures, readings and discussions of current concepts in basic and applied microbiology, with emphasis on microbial metabolism and physiology.

BIO 524 ADVANCED CELL BIOLOGY 3

Explores the structure and function of cells through their biochemical, molecular, and physiological activities.

BIO 530 BEHAVIORAL ECOLOGY 3

An advanced course examining adaptive individual and social behavior. Cost/benefit analyses of adaptive behavior, using examples from the current literature.
Prerequisite(s): Courses in ecology, genetics, and animal behavior.

BIO 535 PROBLEMS IN FIELD BIOLOGY 1 - 3

A course designed to acquaint students with field-oriented problems in biology.

BIO 538 POPULATION BIOLOGY 3

An advanced course considering the relationship of genetics and ecology. Emphasis on the growth and regulation of natural populations.
Prerequisite(s): Ecology; genetics.

BIO 538L POPULATION BIOLOGY 1

Field and laboratory exercise to accompany BIO 538.

BIO 540L PHYSIOLOGY OF HIGHER PLANTS LABORATORY 1

Laboratory concerned with uptake and transport of materials, energy metabolism and growth in higher plants.

BIO 545 EVOLUTION AND DEVELOPMENT 3

A molecular and population genetic examination of the evolution of animal form. Topics include comparative developmental biology, population genetics, and molecular evolution.
Prerequisite(s): Student status in Biology or permission of instructor.

BIO 546 PLANT DEVELOPMENT 3

Study of the major organ systems of the vascular plants with emphasis on the nature of their cell types and tissue composition and their patterns of development.

BIO 546L PLANT DEVELOPMENT LABORATORY 1

BIO 550 BIOMETRICS 3

Design and analysis of experiments in quantitative biology. Parametric and nonparametric analyses of both laboratory and field-generated data sets.

BIO 552 BIOLOGICAL INSTRUMENTATION 6

This course is required of all graduate students, and is designed to acquaint students with advanced laboratory techniques used in biological research. Topics include theory and applications of protein and nucleic acid techniques, data analysis, and preparation of scientific manuscripts, posters and grant proposals.

BIO 553 BIOLOGICAL INSTRUMENTATION 4

A continuation of BIO 552.

BIO 555 LABORATORY TECHNIQUES (TOPIC) 1 - 3

Advanced treatment of new techniques and instrumentation used in specialized areas of biology. Changes with advances in a specialty are reflected in the course title.

BIO 560 ADVANCED BIOINFORMATICS 3

This course familiarizes the student with the concepts and tools involved in bioinformatics research, using appropriate material from the disciplines of biology, chemistry and computer science, among others.

BIO 570 ADVANCED DEVELOPMENTAL BIOLOGY 3

An advanced course on the principles of animal development with emphasis on concepts and experimental evidence for underlying mechanisms. This course is designed to present the latest and newest advances in development, and includes discussion on the use of current model systems. **Prerequisite(s):** Introductory course in developmental biology and cell biology or permission of instructor.

BIO 594 MOLECULAR BIOLOGY - THEORY AND PRACTICE 3

Introduction to the theory and practice of molecular biology techniques. Topics and laboratory exercises include the enzymatic manipulation of DNA and RNA, Southern and Northern blotting, library screening, DNA sequencing, DNA amplification, and gene promoter structure and function.

BIO 596 CURRENT BIOLOGY PROBLEMS 1 - 3

Consideration of recent developments in biological thought and procedure. **Prerequisite(s):** Permission of department chairperson.

BIO 599 THESIS 3 - 6

Research for the master's degree.

BIO 601 SPECIAL TOPICS 1

Development, presentation, and discussion of topics in specialized areas of biology. Required of graduate students each semester.

BIO 699 DISSERTATION 3 - 6

Research for the doctoral degree.

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the Bulletin
AUGUST 2006 - GRADUATE ISSUE
Explore a Different Issue

School of Business Administration

(MBA) Business Administration

Programs

Program Name

Master of Business Administration (MBA)

MBA Curriculum

The MBA Program is a 30 semester credit hour program for the student with a recent undergraduate background in business. For the student with a non-business background, or who lacks coursework in key areas of undergraduate business study, foundation courses are required.

A common core of six courses, (18 semester hours), is required for all students. Additional breadth or depth in a selected subject area may be achieved by taking four courses (12 semester hours) of elective courses for the required program total of 30 semester hours.

Program of Study

Program Prerequisites
For international students for whom English is a second language, the University's English Language and Multicultural Institute (ELMI) offers courses for improving business verbal and written communication skills, as well as GMAT and TOEFL test scores.

There are four groups of courses in the MBA program:

Group I: Foundation Segment
Group II: Integrated Core Segment
Group III: Capstone Segment
Group IV: Elective Courses

Foundation Segment: Students who need coursework in basic business knowledge and skills are required to take the appropriate course(s) from the following foundation courses. The Foundation Segment consists of a variety of courses up to a maximum of 22 hours. All foundation courses (except MBA 620 and MBA 670) are accelerated, half-semester courses.

A student applying to the MBA program may have foundation coursework waived if appropriate undergraduate studies with earned grades of C or better have been completed within seven years. Grades earned from undergraduate coursework will not be calculated in the cumulative MBA grade point average. However, grades earned from MBA foundation courses will be calculated into the cumulative MBA grade point average. Whenever foundation courses are required, they must, when offered, be completed before proceeding to core or elective courses. For information on appropriate undergraduate courses to waive foundation requirements, contact the MBA office.

Placement exams, which waive foundation courses, are also available to students who can demonstrate experience or knowledge in a particular area. All placement exams should be taken prior to the second term of enrollment, and are offered at no cost to the student. They can be scheduled by calling the MBA office at (937) 229-3733.

Integrated Core Segment: The integrated core portion of the program consists of four 3.0 credit hour required courses: MBA 691, 692, 693, and 694.

Capstone Segment: The Capstone Segment of the program consists of two 3.0 credit hours required courses completed over two semesters: MBA 698 and 699.

Explore by Department:

Aerospace Engineering
Biology
Business Administration
Chemical Engineering

Explore

Explore by Program:

Applied Mathematics (MAS)
Art Education (MSE.EAR) (EDT)
Biology (BIO)
Business Administration (MBA)

Explore

Explore by Courses:

Aerospace Engineering (AEE)
Biology (BIO)
Business Administration (MBA)
Chemical Engineering (CME)

Explore

Elective Courses: Twelve hours of elective courses are required. They may be selected to obtain program breadth or depth in a particular area by choosing a concentration. The student may choose from among the MBA courses offered, or with approval by the MBA director, students may elect up to six semester hours of graduate courses from other programs at the University when these are appropriate to their education plans.

Time Limitation
All coursework, exclusive of foundation courses, must be completed within five calendar years of enrollment.

Program Concentrations

Students may choose their electives to acquire a program concentration. Specific concentrations are offered in accounting, entrepreneurship, finance, international business, management information systems, operations management, marketing, and technology-enhanced business/e-commerce. Selection of an area of concentration is the option of the student; however, it is the responsibility of the student to notify the MBA Office to "declare" the concentration. The area of concentration is noted on the student's transcript. A minimum of nine semester hours of concentration-based elective credit is required for each concentration selected, except for the accounting concentration, which requires 12 semester hours.

Possible Programs of Study

The University of Dayton's MBA curriculum has the flexibility often needed by business professionals: students may begin any term and may proceed at any pace from one course per term to three or four courses per term. The following curriculum requirements must be satisfied: (1) foundation courses (or waiver from them) first, (2) integrated core courses in any order but prior to the capstone courses, and (3) the second capstone (MBA 699) after the first (MBA 698). Each year, full schedules of courses are offered in the fall and winter semesters. In addition, a partial schedule of courses is offered each summer in two convenient, accelerated summer sessions.

As illustrations, the following show two programs of study to complete the MBA on a part time basis.

Program of Study Example 1:
- Two courses per term pace
- Foundations already completed
- Degree requirements of 30 hrs.
- A concentration may be earned if desired

- First Term:*
  MBA 691 Analytic Framework for Business Decision Making
  MBA 692 High Quality Operational Systems
- Second Term:
  MBA 693 Managing Information and People in Organizations
  Elective
- Third Term:
  MBA 694 Managing Financial Resources for Marketing Strategies
  Elective
- Fourth Term:
  MBA 698 Leadership, Strategy, and Stakeholder Management
  Elective
- Fifth Term:
  MBA 699 Capstone Integrative Project
  Elective

  *In a summer term, this may need to be adjusted.

Program of Study Example 2:
- Two or three courses per term pace
- Foundations already completed
- Degree requirements of 30 hrs.
- A concentration may be earned if desired

- First Term:*
  MBA 691 Analytic Framework for Business Decision Making
  MBA 692 High Quality Operational Systems
  Elective
- Second Term:*
  MBA 693 Managing Information and People in Organizations
  MBA 694 Managing Financial Resources for Marketing Strategies
  Elective

- Third Term:
  MBA 698 Leadership, Strategy, and Stakeholder Management
  Elective
- Fourth Term:
  MBA 699 Capstone Integrative Project
  Elective

*In a summer term, this may need to be adjusted.

Master of Business Administration

		Sem. Hrs.
Group I: Foundation Segment[1]		22
MBA 600A	FINANCIAL ACCOUNTING	2
MBA 601A	MANAGERIAL ACCOUNTING	2
MBA 610	BUSINESS DATA ANALYSIS	1.5
MBA 611	STATISTICAL TECHNIQUES FOR DECISION ANALYSIS	1.5
MBA 612	MANUFACTURING AND SERVICE SYSTEMS	1.5
MBA 620	FINANCIAL ANALYSIS AND MARKETS	3
MBA 630	MARKETING ESSENTIALS	1.5
MBA 640	MICROECONOMICS	1.5
MBA 641	MACROECONOMICS	1.5
MBA 650	ORGANIZATIONS AND THEIR ENVIRONMENTS	1.5
MBA 660	INFORMATION TECHNOLOGY AND SYSTEMS	1.5
MBA 670	ORGANIZATIONAL THEORY AND BEHAVIOR	3
Group II: Integrated Core Segment		12
MBA 691	ANALYTIC FRAMEWORK FOR BUSINESS DECISION MAKING	3
MBA 692	OPERATIONAL MANAGEMENT SYSTEMS	3
MBA 693	MANAGING INFORMATION AND PEOPLE IN ORGANIZATIONS	3
MBA 694	MANAGING FINANCIAL RESOURCES FOR MARKETING STRATEGIES	3
Group III: Capstone Segment		6
MBA 698	LEADERSHIP, STRATEGY, AND STAKEHOLDER MANAGEMENT	3
MBA 699	CAPSTONE INTEGRATIVE PROJECT	3
Group IV: Elective Courses (see below)		12

Elective Program Concentrations

Accounting (ACC) Concentration		
MBA 602A	INFORMATION ASSURANCE	3
MBA 602B	FRAUD EXAMINATION	3
MBA 603A	ADVANCED FINANCIAL ACCOUNTING	3
MBA 604A	TAXES AND BUSINESS STRATEGY	3
MBA 604B	ADVANCED ISSUES IN TAXATION	3
MBA 605A	CONTEMPORARY ISSUES IN ACCOUNTING	3
MBA 605B	INTERNATIONAL ACCOUNTING	3
MBA 606A	FINANCIAL STATEMENT/RISK ANALYSIS	3
MBA 607A	STRATEGIC PERFORMANCE MEASUREMENT AND CONTROL: A SYSTEM'S PERSPECTIVE	3
MBA 608A	ACCOUNTING INFORMATION SYSTEMS	3

MBA 609A	SPECIAL TOPICS IN ACCOUNTING	3
MBA 609B	INDIVIDUAL RESEARCH IN ACCOUNTING	3 - 6

Entrepreneurship (ENT) Concentration

MBA 679[2]	SPECIAL TOPICS IN MANAGEMENT AND ENTREPRENEURSHIP	3
MBA 679[3]	SPECIAL TOPICS IN MANAGEMENT AND ENTREPRENEURSHIP	3
MBA 680	ENTREPRENEURSHIP AND THE FAMILY FIRM	3
MBA 682	NEW VENTURE MANAGEMENT	3

Finance (FIN) Concentration

MBA 621	FINANCIAL DERIVATIVES & RISK MANAGEMENT	3
MBA 622	ADVANCED CORPORATE FINANCE	3
MBA 623	COMPUTATIONAL FINANCE	3
MBA 624	COMMERCIAL BANK MANAGEMENT	3
MBA 625	INVESTMENTS AND FINANCIAL MARKETS	3
MBA 626	INTERNATIONAL FINANCIAL MANAGEMENT	3
MBA 627	MANAGEMENT OF FINANCIAL INSTITUTIONS	3
MBA 628	FIXED INCOME ANALYSIS	3
MBA 629	SPECIAL TOPICS IN FINANCE	3

International Business (INT) Concentration

MBA 626	INTERNATIONAL FINANCIAL MANAGEMENT	3
MBA 636	MULTICULTURAL MARKETING	3
MBA 637	GLOBAL MARKETING MANAGEMENT	3
MBA 646	INTERNATIONAL TRADE AND BUSINESS APPLICATIONS	3
MBA 656	EUROPEAN CULTURE & MANAGEMENT (STUDY ABROAD)	3
MBA 676	INTERNATIONAL MANAGEMENT	3

Management Information Systems (MIS) Concentration

MBA 608A	ACCOUNTING INFORMATION SYSTEMS	3
MBA 661	E-COMMERCE	3
MBA 662	BUSINESS TELECOMMUNICATIONS	3
MBA 663	MANAGEMENT OF INFORMATION RESOURCES	3
MBA 664	DATABASE MANAGEMENT	3
MBA 665	SYSTEMS ANALYSIS & DESIGN	3
MBA 667	DATA WAREHOUSING	3
MBA 668	ADVANCED WEB SITE DEVELOPMENT	3
MBA 669	SPECIAL TOPICS IN MANAGEMENT INFORMATION SYSTEMS	3

Marketing (MKT) Concentration

MBA 632	SERVICES MARKETING	3
MBA 634	CONSUMER BEHAVIOR	3
MBA 635	MARKET ANALYSIS AND RESEARCH	3
MBA 636	MULTICULTURAL MARKETING	3
MBA 637	GLOBAL MARKETING MANAGEMENT	3
MBA 638	PRODUCT PLANNING AND DEVELOPMENT	3
MBA 639	SPECIAL TOPICS IN MARKETING	3
MBA 679[4]	SPECIAL TOPICS IN MANAGEMENT AND ENTREPRENEURSHIP	3

Operations Management (OM) Concentration

ENM 505	CASE STUDIES - DESIGN IN ENGINEERING	3
ENM 515	HUMAN FACTORS ENGINEERING	3

ENM 530	COST AND ECONOMIC ANALYSIS FOR ENGINEERS	3
ENM 560	QUALITY ASSURANCE	3
ENM 561	DESIGN AND ANALYSIS OF EXPERIMENTS	3
MBA 607A	STRATEGIC PERFORMANCE MEASUREMENT AND CONTROL: A SYSTEM'S PERSPECTIVE	3
MBA 613	JIT AND QUALITY IN MANUFACTURING AND SERVICES	3
MBA 614	ANALYSIS OF FACTORY SYSTEMS	3
MBA 617	BUSINESS PROCESS IMPROVEMENTS	3
MBA 618	OPERATIONS MANAGEMENT RESEARCH SEMINAR	3
MBA 619	SPECIAL TOPICS IN OPERATIONS MANAGEMENT	3
MEE 580	STATISTICAL PROCESS CONTROL BY FEEDBACK ADJUSTMENT	3
MEE 582	AUTOMATED DESIGN	3
MEE 584	INTEGRATED MANUFACTURING SYSTEMS	3
MEE 585	DESIGN FOR PRODUCIBILITY	3

Please consult with the MBA Office for additional Engineering courses that may qualify for the OM concentration.

Technology-Enhanced Business/E-Commerce (TEB) Concentration

MBA 661[5]	E-COMMERCE	3
MBA 662	BUSINESS TELECOMMUNICATIONS	3
MBA 667	DATA WAREHOUSING	3
MBA 668	ADVANCED WEB SITE DEVELOPMENT	3
MBA 669[6]	SPECIAL TOPICS IN MANAGEMENT INFORMATION SYSTEMS	3

[1]A student applying to the MBA program may have foundation coursework waived if appropriate undergraduate studies with earned grades of C or better have been completed within seven years. See program description above for more details.

[2]Course will focus on advanced competitive analysis.

[3]Course will focus on financing entrepreneurial ventures.

[4]MBA 679 Advanced Competitive Analysis applies to the Marketing concentration

[5]This is a required course for the Technology-Enhanced Business/E-Commerce (TEB) concentration.

[6]Only the following "Special Topics" classes are applicable to the TEB concentration:"Technology-Enabling E-Business", Internet Networking", "Internet Security", and IT-Enabled Organizational Forms".

Courses (Collapse All Courses)

Code Title Sem. Hrs.

MBA 600A FINANCIAL ACCOUNTING 2

An introduction to the concepts and procedures underlying financial accounting and the use of financial accounting information for decision making.

MBA 601A MANAGERIAL ACCOUNTING 2

An introduction to the concepts underlying the preparation and use of accounting data by managers as they plan, control, and make decisions within the organization. Topics include just-in-time (JIT) systems, activity-based costing (ABC), flexible manufacturing environment, theory of constraints, and cost of quality.
Prerequisite(s): MBA 600A.

MBA 602A INFORMATION ASSURANCE 3

An exploration of the various ways that accounting provides forms of assurance to information users in making important economic decisions through the use of traditional audit methodologies and an expansion of the audit sphere into attestation and assurance practices.
Prerequisite(s): ACC 401 or permission of instructor.

MBA 602B FRAUD EXAMINATION 3

Study of topics related to the detection, investigation, and prevention of accounting fraud. This course will concentrate on occupational fraud, where the victim is the employer, and financial statement fraud, where the victims are the external users of financial statement information.
Prerequisite(s): (MBA 600A, 601A) or equivalent.

MBA 603A ADVANCED FINANCIAL ACCOUNTING 3

Study of the principles and procedures of accounting for business combinations, consolidated financial statements, government and not-for-profit organizations, multinational subsidiaries and foreign currency transactions.
Prerequisite(s): ACC 305 or permission of instructor.

MBA 604A TAXES AND BUSINESS STRATEGY 3

Primary emphasis is given to developing a framework that articulates how effective tax planning affects business decisions. An advantage of the frameworkover a strictly rules-based course is that it can be applied to current and future tax regimes, as well as across tax jurisdictions. Significant emphasis is given to understanding how to account for income taxes for financial statement purposes. Although not techincally a rules-based course, application of the effective tax planning framework, to cases and problem-solving exercises will increase students' knowledge of U.S.Tax rules and the factors that shape them.
Prerequisite(s): MBA 600A, 601A.

MBA 604B ADVANCED ISSUES IN TAXATION 3

Study of the current federal income tax code and its application to individuals and business entities. Emphasis is placed on the technical issues and planning opportunities that businesses face.
Prerequisite(s): MBA 600A, 601A. Also, ACC 420 or permission of instructor is required.

MBA 605A CONTEMPORARY ISSUES IN ACCOUNTING 3

Seminar covering emerging or controversial accounting issues for the student who has a strong accounting background. Topics include the business and financial situations that underlie accounting problems and controversies, alternative accounting techniques which are accepted or proposed, and the consequences of various accounting practices.
Prerequisite(s): ACC 306 or permission of instructor.

MBA 605B INTERNATIONAL ACCOUNTING 3

Study of current topics in international accounting. This course will typically include a week or more of study outside of the U.S. that will include lectures and relevant site visits. In addition to normal tuition, there may be travel and other costs or fees. Foreign locations, countries, topics, and duration may vary.
Prerequisite(s): ACC 306 or permission of instructor.

MBA 606A FINANCIAL STATEMENT/RISK ANALYSIS 3

A study of the tools and techniques of financial statement analysis to include a consideration of various alternatives and techniques and the impact of economics and accounting measurements.
Prerequisite(s): ACC 306 or permission of instructor.

MBA 607A STRATEGIC PERFORMANCE MEASUREMENT AND CONTROL: A SYSTEM'S PERSPECTIVE 3

The design and use of performance measurement and control systems from an integrated systems view of an organization. An important aspect of the course is to "think out of the box" in terms of how to design more flexible and adaptive cost management systems to help organizations become more flexible and responsive in meeting customer needs. While such traditional topics as balanced scorecards, activity-based costing, performance measurement and control are discussed, these topics are reexamined in light of an integrated systems view of an organization.
Prerequisite(s): (ACC 303; MBA 692) or permission of instructor.

MBA 608A ACCOUNTING INFORMATION SYSTEMS 3

A study of accounting information systems and their impact on management decision making and control. Emphasis on the systems approach to the collection and reporting of accounting data, system internal controls, and computer applications for managerial and financial accounting.
Prerequisite(s): (ACC 341; MBA 660) or permission of instructor.

MBA 609A SPECIAL TOPICS IN ACCOUNTING 3

Advanced and current topics in accounting. Topics vary.
Prerequisite(s): Permission of instructor.

MBA 609B INDIVIDUAL RESEARCH IN ACCOUNTING 3 - 6

Individual research in accounting subjects under the guidance and direction of an accounting faculty member. A formal proposal must be completed and approved by the faculty member, Department Chair, and MBA Director prior to registration.
Prerequisite(s): Permission of instructor; strong academic and/or professional background in accounting.

MBA 610 BUSINESS DATA ANALYSIS 1.5

An introduction to the statistical techniques of collecting, classifying, and analyzing data, the fundamentals of probability theory, probability distributions, the central limit theorem, and estimation.

MBA 611 STATISTICAL TECHNIQUES FOR DECISION ANALYSIS 1.5

An introduction to methods that are central in generating information for decision analysis. Topics include hypothesis testing, regression analysis, and experimental design.
Prerequisite(s): MBA 610.

MBA 612 MANUFACTURING AND SERVICE SYSTEMS 1.5

An introduction to both traditional and modern manufacturing and service systems, including operating philosophies that drive these systems and the important tools and techniques used therein.
Prerequisite(s): MBA 610; 611.

MBA 613 JIT AND QUALITY IN MANUFACTURING AND SERVICES 3

Study of the concepts and techniques of just-in-time manufacturing, total quality systems, and statistical process control. Projects, tours, and guest speakers.
Prerequisite(s): MBA 692.

MBA 614 ANALYSIS OF FACTORY SYSTEMS 3

Study of the concepts and techniques of analysis, design, and management of factory production systems. Work-flow layout, scheduling techniques, stochastic process models, simulations and computerized factory models.
Prerequisite(s): MBA 610, 611, 612, 691.

MBA 617 BUSINESS PROCESS IMPROVEMENTS 3

A study of the concepts and techniques of business process analysis and improvements as building blocks for all operations improvement strategies, using a range of tools from simple process-mapping to computer-based process-modeling. Balancing technical/analytical and organizational/behavioral aspects of business process improvements are highlighted. The class will include a business process analysis/improvement project using a process modeling software.
Prerequisite(s): MBA 610, 611, 612.

MBA 618 OPERATIONS MANAGEMENT RESEARCH SEMINAR 3

Individual research effort in conjunction with a faculty member. The seminar will meet several times during the term for research progress presentations.
Prerequisite(s): One OPM elective.

MBA 619 SPECIAL TOPICS IN OPERATIONS MANAGEMENT 3

Advanced or special topics in the analysis, design, operation, and maintenance of manufacturing and service systems. Topics vary.
Prerequisite(s): Permission of instructor.

MBA 620 FINANCIAL ANALYSIS AND MARKETS 3

An overview of finance to include the analysis of financial statements, valuation concepts, capital budgeting techniques, capital structure analysis, working capital management, and capital market financing instruments.
Prerequisite(s): MBA 600A.

MBA 621 FINANCIAL DERIVATIVES & RISK MANAGEMENT 3

This course provides a theoretical foundation for the pricing of contingent claims and for designing risk-management strategies. It covers option pricing models, hedging techniques, and trading strategies. It also includes portfolio insurance, value-at-risk measure, multistep binomial trees to value American options, interest rate options, and other exotic options.
Prerequisite(s): MBA 620; permission of instructor.

MBA 622 ADVANCED CORPORATE FINANCE 3

This course is focused upon interesting corporate finance issues addressing short term financial management, long term capital budgeting, and long term financing choices. The course requires that the students understand these issues through a series of cases and projects. A significant amount of spreadsheet modeling together with both individual and group work will be required to examine the cases and projects.
Prerequisite(s): MBA 620.

MBA 623 COMPUTATIONAL FINANCE 3

The purpose of this course is to introduce students to numerical methods and various financial problems that include portfolio optimization and derivatives valuation that can be tackled by numerical methods. Students will learn the basics of numerical analysis, optimization methods, monte carlo simulations and finite difference methods for solving PDEs.
Prerequisite(s): MBA 620; permission of instructor.

MBA 624 COMMERCIAL BANK MANAGEMENT 3

Explores the environment in which banks must operate, the financial statements of banks, and a thorough study of bank management topics, including asset-liability management, the investment portfolio, sources of funds, and the loan portfolio.
Prerequisite(s): MBA 620.

MBA 625 INVESTMENTS AND FINANCIAL MARKETS 3

A study of investment principles and techniques used by both individual and institutional investors. Topics include bond and stock markets, security valuation methods, portfolio theory and management, and investment institutions.
Prerequisite(s): MBA 620.

MBA 626 INTERNATIONAL FINANCIAL MANAGEMENT 3

Integrates the international monetary environment with the multinational business firm and its operations. Analyzes the balance of international payments and exchange rate determination. Specific international financial management topics include export-import financing, foreign direct investment, foreign exchange risk management, financial controls, and international capital budgeting.
Prerequisite(s): MBA 620.

MBA 627 MANAGEMENT OF FINANCIAL INSTITUTIONS 3

This course studies management issues related to depositories, insurance companies, mutual funds, investment advisors, and investment banks. It includes a review of the financial system, regulatory bodies, financial instruments, and interest rates.
Prerequisite(s): MBA 620.

MBA 628 FIXED INCOME ANALYSIS 3

This class will expose students to a variety of fixed income instruments that are traded in the financial markets, their investment characteristics, the state-of-art technology for valuing them, technique for quantifying their interest rate risk, and portfolio strategies for using them. Great course for

CFA candidates, Fund Managers, Credit Risk Managers, Commercial Bankers and anyone interested in investing in fixed income securities as alternatives to stocks.
Prerequisite(s): MBA 610, 611, 620.

MBA 629 SPECIAL TOPICS IN FINANCE 3

In-depth application of financial principles to selected areas. Topics vary. Emphasis may be on working capital management, capital budgeting, applied portfolio management, mergers and acquisitions, corporate restructuring, or selected topics.
Prerequisite(s): Permission of instructor.

MBA 630 MARKETING ESSENTIALS 1.5

Fundamentals of marketing, including macro and micro concepts that affect marketing management. An introduction to marketing terminology, definitions, theories, concepts, and practices. Emphasis on decision variables used by marketing managers, both at the domestic and global level.

MBA 632 SERVICES MARKETING 3

The course is designed to focus on marketing opportunities, challenges, methods, strategies, and other aspects of marketing that are unique to services oriented businesses. The course emphasizes the environmental approach to services marketing. The students are introduced to the basic concepts of services marketing. The course material focuses on environment and on the modifications of marketing theory and its applications in the services marketing organizations.
Prerequisite(s): MBA 630.

MBA 633 SALES MANAGEMENT 3

A study of the basic principles and practices of sales management. Rather than viewing sales management as containing separate functions and activities, (such as staffing, training, motivation), this course views them as having systemic relationships with each other. All functions and activities will be viewed as a dynamic process, composed of numerous interrelated parts; all aimed at helping the organization reach its sales objectives. Analyzes the structure of the sales organization, determination of sales policies, selection, training, and motivation of salesperson, and establishing sales territories, and quotas.
Prerequisite(s): MBA 630.

MBA 634 CONSUMER BEHAVIOR 3

Consumer Behavior is the study of those actions directly involved in obtaining, consuming, and disposing of products and services, including the decision processes that precede and follow these actions. Consumer behavior is of particular interest to those who, for various reasons, desire to influence or change that behavior, including those whose primary concern is marketing, consumer education and protection, and public policy. Consumer behavior is studied within the context of marketing strategy, and market segmentation.
Prerequisite(s): MBA 630.

MBA 635 MARKET ANALYSIS AND RESEARCH 3

The purpose of marketing research is to provide decision makers with useful consumer and customer information to reduce uncertainty about alternative courses of business action, and aid in marketing management decision making and planning. To make the wisest decisions and accomplish the best, this course focuses on showing decision makers how to effectively use information provided by marketing research.
Prerequisite(s): MBA 611, 630.

MBA 636 MULTICULTURAL MARKETING 3

The course is designed to introduce students to the basic concepts and theories of multicultural marketing. The main goals of this course are for students to acquire a basic understanding of the elements of other cultures, to be aware of cultural differences, and to get students to appreciate the importance of cultural adaptation in the marketing program, especially as they relate to the development of marketing systems.
Prerequisite(s): MBA 630.

MBA 637 GLOBAL MARKETING MANAGEMENT 3

Integration of concepts, theories, and analytical procedures associated with market analysis of global markets. This course provides a managerial and strategic perspective on global marketing. It is designed to assist students in developing appropriate business skills and making marketing management decisions in the global context.
Prerequisite(s): MBA 630.

MBA 638 PRODUCT PLANNING AND DEVELOPMENT 3

Integration of various product management processes and concepts as customer-focused problem solving. Using projects or simulations, provides an opportunity to practice skills in developing and introducing a new product in a competitive environment. Emphasis on how various techniques can be interpreted to answer questions about performance.
Prerequisite(s): MBA 630.

MBA 639 SPECIAL TOPICS IN MARKETING 3

Advanced and current topics in marketing, such as product management, consumer behavior, services marketing, sales, and advertising.
Prerequisite(s): Permission of instructor.

MBA 640 MICROECONOMICS 1.5

Basic microeconomic principles and their applications. Topics include consumer behavior, production theory, and the interaction of buyers and sellers in various kinds of markets.

MBA 641 MACROECONOMICS 1.5

Basic macroeconomic principles and their applications. Topics include national income, monetary policy, fiscal policy, and the economic role of the government in the United States.

MBA 646 INTERNATIONAL TRADE AND BUSINESS APPLICATIONS 3

This course introduces a comprehensive and up to date exposition of the theories and applications of international trade that are essential for understanding and suggesting solutions to the important contemporary international trade problems facing firms and managers. Topics cover comparative advantage, gains from trade, imperfect competition and international trade, trade and economic growth, trade policies, economic integration, resource movements and multinational corporations.
Prerequisite(s): MBA 640, 641.

MBA 648 GAME THEORY WITH BUSINESS APPLICATIONS 3

This course provides a thorough discussion of economics of strategic behavior, including both non-cooperative and cooperative solutions, with a focus on practical business applications. Topics cover simultaneous-move games, sequential-move games, games with incomplete information, bargaining theory, and auction design and bidding strategy. The main objective of this course is to provide a rigorous yet accessible introduction to Game Theory (science of strategic behavior) and its business applications such as the dynamics of entering an industry, managing competitive interaction (cooperation and preemption), and corporate takeovers.
Prerequisite(s): MBA 640.

MBA 649 SPECIAL TOPICS IN ECONOMICS 3

Advanced and current topics in economics. Topics vary.
Prerequisite(s): Permission of instructor.

MBA 650 ORGANIZATIONS AND THEIR ENVIRONMENTS 1.5

A study of the social, cultural, political, and legal environments of organizations (profit and non-profit) and of their impact on management at all levels. Emphasis is given to resultant problems and their resolution to include ethical considerations in the policy decision process.

MBA 651 GOVERNMENT AND BUSINESS 3

Analysis of government regulations and their impact on business. An examination of how business organizations, when producing goods and services, operate within the financial, legal, and social constraints resulting from governmental activity.
Prerequisite(s): MBA 670.

MBA 652 SOCIAL RESPONSIBILITY AND ETHICAL DIMENSIONS OF MANAGEMENT 3

Study of ethical responsibility in the business setting. Topics include the relationship of management to society, ethical issues in management, the virtues of leaders, strategic management for social responsiveness, management styles in the global marketplace, and the stakeholder management concept.
Prerequisite(s): MBA 670.

MBA 653 CORPORATE ISSUES & SURVEY PRACTICUM 3

An overview of management concepts, principles, and functionality as practiced by major corporations. Each student has the opportunity to develop an innovative alternative to a current issue related to corporate finance, marketing, and/or management. Includes presentations by a team of corporate executives.
Prerequisite(s): Completion of all foundation courses.

MBA 654 HUMANITIES INSTITUTE 3

A multi-weekend course designed for in-depth discussions of ethics, values, and justice based on the study of art, literature, philosophy, and history. Throughout the course, issues are assessed from the perspective of the business professional. An additional fee to cover course supplies.
Prerequisite(s): Completion of all foundation courses.

MBA 656 EUROPEAN CULTURE & MANAGEMENT (STUDY ABROAD) 3

Study of the culture and business operations of Europe. This course will typically include a week or more of study outside of the U.S. that will include lectures and relevant site visits. In addition to normal tuition, there will be travel and other expenses. Locations, countries, and topics may vary.
Prerequisite(s): Completion of all foundation courses or permission of faculty member.

MBA 659 SPECIAL TOPICS - ORGANIZATIONS AND THEIR ENVIRONMENTS 3

Advanced and current topics in organizations and their environments. Topics vary.
Prerequisite(s): Permission of instructor.

MBA 660 INFORMATION TECHNOLOGY AND SYSTEMS 1.5

An introduction to the basic technology underlying information systems and to the concepts and techniques needed to analyze, design, and manage those systems.

MBA 661 E-COMMERCE 3

This course provides an understanding of the information technologies that enable business-to-business and business-to-consumer electronic commerce while focusing on the strategic, operational, management, and societal issues associated with such technology-based commerce. Business cases, experiential exercises, and guest speakers are utilized. This is a required course for the Technology-Enhanced Business/E-Commerce (TEB) concentration.
Prerequisite(s): MBA 660.

MBA 662 BUSINESS TELECOMMUNICATIONS 3

Study of computer-based business communication systems. Media characteristics, signal representation and transmission, wide and local area networks, communication protocols, message routing, network design, and network management. Assignments include a term paper requiring an in-depth study of a selected topic.
Prerequisite(s): MBA 610, 660.

MBA 663 MANAGEMENT OF INFORMATION RESOURCES 3

Study of the strategic and management issues associated with the effective organizational use of information technology. Role of the chief information officer; strategic planning, impacts and alliances; information technology assimilation; information technology architectures, functional organization, and operational control; information systems project management. Cases and readings.
Prerequisite(s): MBA 660; MBA 693 recommended.

MBA 664 DATABASE MANAGEMENT 3

Introduction to databases and their management. File organization and data structures; database management systems; major data models; conceptual, logical, and physical database design; data definition and manipulation with SQL; data administration; and client/server and distributed databases. SQL-based software tool for database project.
Prerequisite(s): MBA 660.

MBA 665 SYSTEMS ANALYSIS & DESIGN 3

Introduction to object-oriented concepts and techniques for analyzing and designing systems. Activities performed and models created during the different phases of the development life cycle. Systems development project using a CASE tool.
Prerequisite(s): MBA 660.

MBA 667 DATA WAREHOUSING 3

This course will emphasize the purpose, design, implementation, and effective use of data warehouses and data warehousing technologies. Various schemas for the design of a data warehouse, modeling time in a data warehouse, data quality management for building a data warehouse from operational data stores and legacy applications, and technologies to populate and retrieve information from data warehouses will be covered. Related topics of data marts, analytical processing, data mining, and active data warehousing will also be addressed.
Prerequisite(s): (MBA 660, 664) or an approved graduate course in database management.

MBA 668 ADVANCED WEB SITE DEVELOPMENT 3

This course covers issues involved in developing Web sites for business usage. Issues covered or investigated include: site layout, implementation and management, good site design practices, connecting Web sites to company data, and processing secure transactions across the Web.
Prerequisite(s): HTML and a high-level programming language required.

MBA 669 SPECIAL TOPICS IN MANAGEMENT INFORMATION SYSTEMS 3

Advanced and current topics in management information systems. Topics vary.
Prerequisite(s): Permission of instructor.

MBA 670 ORGANIZATIONAL THEORY AND BEHAVIOR 3

An introduction to management topics conceptualized at the organization and subunit levels of analysis with primary focus on how organizations generate capacities for change in response to their environments. Emphasis on organizational design as a means of adaptation.

MBA 676 INTERNATIONAL MANAGEMENT 3

This course focuses on international aspects of organizational behavior, human resource management, labor relations, corporate strategy, and ethical issues and revolves around three objectives: examining the applicability of theory and research in the international management area; surveying topical issues in international management; and developing students' international management skills.
Prerequisite(s): MBA 670.

MBA 679 SPECIAL TOPICS IN MANAGEMENT AND ENTREPRENEURSHIP 3

Analysis and interpretation of research studies as applied to management and entrepreneurship. Coverage of issues such as leadership, interpersonal conflict resolution, competitive analysis, new venture issues, resistance to change, managerial development, organizational growth, effects of technology, and emergence of new control systems. Role playing, small

group exercises and applications.
Prerequisite(s): Permission of instructor.

MBA 680 ENTREPRENEURSHIP AND THE FAMILY FIRM 3

A variety of topics of interest to the student of entrepreneurship. All phases in the life span of the owner-managed enterprise, beginning with opportunity recognition and ending with succession to a next generation of management through any of a variety of means. Major topic areas include startup issues, business planning, financing, marketing, managing the growing firm, and succession. Guest speakers provide insights from their experience as entrepreneurs, and panels of experts who serve entrepreneurial clients are often utilized. Each class period uses multiple learning methodologies. Some field work and writing is required.
Prerequisite(s): Completion of all foundation courses.

MBA 681 BUSINESS SIMULATION 3

An integrative learning experience based on knowledge of the functional business areas and of the business environment. Computer simulation used to examine the effect of students' management decisions over time. Lectures and small groups for decision-making reporting.
Prerequisite(s): Completion of all four Integrated Core courses is recommended.

MBA 682 NEW VENTURE MANAGEMENT 3

A study of entrepreneurship and development of opportunities in new or renewed businesses. Focus is on identifying and analyzing business opportunities, locating and obtaining venture capital, developing a business plan, managing growth in the enterprise, and the decision-making, risk-taking, and leadership styles of entrepreneurs.
Prerequisite(s): (MBA 620, 630) or equivalent.

MBA 691 ANALYTIC FRAMEWORK FOR BUSINESS DECISION MAKING 3

An examination of the role of analytic thinking and analytic models and techniques in providing support and insight for business decision making. Types of business decisions studied include product price, production level, production mix, distribution system design, operational process design, and others. Spreadsheets facilitate such analytic techniques as mathematical optimization, regression analysis, linear and integer programming models, and simulation models.
Prerequisite(s): Completion of all foundation courses.

MBA 692 OPERATIONAL MANAGEMENT SYSTEMS 3

High quality goods and services require efficient, effective, and adaptable operational systems. This course will focus on the design and implementation of these operational systems and their relationship to strategic cost management. Topics include systems theory, total quality management, activity-based costing/management, theory of constraints, target costing and performance measurement and control systems. The classroom environment requires significant student interaction, team-based assignments, and an interdisciplinary integration of concepts and applications.
Prerequisite(s): Completion of all foundation courses.

MBA 693 MANAGING INFORMATION AND PEOPLE IN ORGANIZATIONS 3

This course addresses two key resources in business organizations: information technology and people. It draws from the fields of management information systems, organizational behavior, and organization theory. Students focus on understanding how managing information, organization design, information technology, and human resources in an integrative manner can enhance the productivity of knowledge workers and work groups/teams, as well as the effectiveness of contemporary organizations.
Prerequisite(s): Completion of all foundation courses.

MBA 694 MANAGING FINANCIAL RESOURCES FOR MARKETING STRATEGIES 3

This course uses an integrative framework incorporating financial and marketing analyses to study the relationships between its customers and its contributors of financial capital, to study the sources of firm valuation, and to

study corporate decision making. The methodology in the course employs cases and group projects.
Prerequisite(s): Completion of all foundation courses.

MBA 695 INDIVIDUAL RESEARCH 1 - 6

Individual research in subjects encompassed by the MBA curriculum under the guidance and direction of a faculty member. Research may be undertaken on completion of 12 hours of post-foundation coursework. A formal proposal must be completed and approved by the faculty advisor and the MBA Director prior to registration.
Prerequisite(s): Permission of instructor.

MBA 698 LEADERSHIP, STRATEGY, AND STAKEHOLDER MANAGEMENT 3

First of a two-course set of capstone integrative experiences which explores the process of creating, sustaining, and growing successful businesses in an era of change. The course deals with strategic decision making and stakeholder management related to competitive, economic, political, social, cultural, and technological environments in small, medium, and large companies in service and manufacturing settings.
Prerequisite(s): Completion of all four core courses (MBA 691, 692, 693, 694) or permission from MBA Director.

MBA 699 CAPSTONE INTEGRATIVE PROJECT 3

Second of the two-course set of capstone integrative experiences that explores the process of creating, sustaining, and growing successful businesses in an era of change. Students work in teams to analyze the strategic environment of a firm and develop a series of recommended actions. Students gain experience in working in a team environment in a non-academic setting, and experience the pressure of delivering a high-quality product to company leaders. The approach taken is tailored to the specific needs of the business as well as the talents of the particular student team.
Prerequisite(s): MBA 698; completion of the four core courses.

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School of Engineering

(CME) Chemical Engineering (Collapse Description)

Tony E. Saliba, Chair of the Department

Programs

Program Name

- Master of Science in Chemical Engineering (CME)

The program of study leading to the Master of Science in chemical engineering must include a minimum of 30 semester hours consisting of the following:

1. Fifteen semester hours of chemical engineering graduate courses, including CME 507, 521 or 522, 542 or 543, and 581 or 582.
2. Nine semester hours of electives as approved by the advisor and the department chair.
3. Six semester hours on an approved thesis project; a final examination is required at the completion of the thesis. Upon the request of the student and with the approval of the faculty advisor and chair of the department, six hours of additional coursework plus three hours of special problem work may be substituted for the thesis.

A final examination is required at the completion of the thesis or coursework. See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the advisor. The program of study allows concentrations in the following areas:

- Combustion
- Environmental Engineering
- Materials Engineering
- Process Modeling and Control

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
CME 507	ADVANCED THERMODYNAMICS	3

Entropy balance. Thermodymanics of energy conversion. Mixtures. Equilibria. Current applications.

Code	Title	Sem. Hrs.
CME 508	ADVANCED TOPICS IN CHEMICAL ENGINEERING	3

Study and discussion of current problems in chemical engineering research.
Prerequisite(s): (CME 521 or 581) or permission of instructor.

Code	Title	Sem. Hrs.
CME 509	INTRODUCTION TO POLYMER SCIENCE	3

Broad technical overview of the nature of synthetic macromolecules, including the formation of polymers and their structure, structure-property relationships, polymer characterization and processing, and applications of polymers. The course tends to focus on thermoplastic polymers and elastomers.
Prerequisite(s): College chemistry; college physics.

Code	Title	Sem. Hrs.
CME 510	PHYSICAL PROPERTIES OF POLYMERS	3

Survey of high performance thermoset resins, including types of thermosets, chemistry, processing, properties, cost, suppliers, and applications. Characterization techniques and typical properties will also be reviewed. The course will also involve a fundamental discussion of cross-linked polymer structure-processing-property relationships, the glassy state, rubber elasticity, time-temperature superposition, and cure kinetics.
Prerequisite(s): (CME 509 or MAT 509) or general and organic chemistry or differential equations or permission of instructor.

CME 511 PRINCIPLES OF CORROSION 3

Application of electrochemical principles, corrosion reactions, passivation, cathodic and anodic protection, stress corrosion, and high-temperature oxidation.
Prerequisite(s): MAT 501.

CME 512 ADVANCED COMPOSITES - MATERIALS AND PROCESSING 3

Comprehensive introduction to advanced fiber reinforced polymeric matrix composites. Constituent materials and composite processing will be emphasized with special emphasis placed on structure-property relationships, the role of matrix in composite processing, mechanical behavior and laminate processing. Specific topics will include starting materials, material forms, processing, quality assurance, test methods, and mechanical behavior.
Prerequisite(s): (MAT 501 or 509) or permission of instructor.

CME 515 STATISTICAL THERMODYNAMICS 3

Microscopic thermodynamics; Boltzmann, Bose-Einstein, Fermi-Dirac statistics; statistical interpretation of thermodynamic quantities. Applications to perfect and real gases, liquids, crystalline solids, and thermal radiation.
Prerequisite(s): CME 311 or MTH 219.

CME 521 ADVANCED TRANSPORT PHENOMENA 3

Applications of the principles of momentum, heat and mass transfer to steady state and transient problems. Molecular concepts. Transport in turbulent flow. Boundary layer theory. Numerical applications.
Prerequisite(s): (CME 324, 381) or equivalent.

CME 522 ADVANCED TOPICS IN TRANSPORT PHENOMENA 3

The equations of change for multicomponent systems. Turbulent mass transport. Interphase transport in multicomponent systems. Combustion analysis. Macroscopic balances.
Prerequisite(s): (CME 325, 581) or equivalent.

CME 524 FUNDAMENTALS AND APPLICATIONS OF FUEL CELLS 3

The course will cover fundamental as well as engineering aspects of fuel cell technology. Specifically, the course will cover basic principles of electrochemistry, electrical conductivity (electronic and ionic) of solids, and development/design of major fuel cells (alkaline, polymer electrolyte, phosphoric acid, molten carbonate, and solid oxide). A major part of the course will focus on solid oxide fuel cells (SOFC), as it is emerging to be dominant among various fuel cell technologies. The SOFC can readily and safely use many common hydrocarbon fuels such as natural gas, diesel, gasoline, alcohol, and coal gas.
Prerequisite(s): (CME 311 or 324) or permission of instructor.

CME 530 CHEMICAL PRODUCT DESIGN 3

Application of design process to products based on chemical technology. Coverage of the entire design process from initial identification of product needs, to the generation and selection of product ideas, and culminating in the manufacture of a new product.
Prerequisite(s): General Chemistry, CME 311 and CME 324.

CME 532 CHEMICAL PRODUCT DESIGN 3

Application of the design process to products based on chemical technology. Coverage of the entire design process from initial identification of product needs, to the generation and selection of product ideas, and culminating in the manufacture of a new product.

CME 541 PROCESS DYNAMICS 3

Mathematical modeling and computer simulation of process dynamics and control for chemical engineering processes.

CME 542 CHEMICAL ENGINEERING KINETICS 3

Reaction kinetics. Heterogeneous catalytic reactions. Transport processes with fluid-solid heterogeneous reactions. Noncatalytic gas-solid reactions. Catalyst deactivation. Gas-liquid reactions.
Prerequisite(s): (CME 381, 406) or equivalent.

CME 543 CHEMICAL REACTOR ANALYSIS AND DESIGN 3

Design for optimum selectivity. Stability and transient behavior of the mixed flow reactor. Nonideal flow and balance models. Fixed and fluidized bed reactors. Multiphase flow reactors.
Prerequisite(s): (CME 381, 406) or equivalent.

CME 550 AGITATION 3

Agitator design and scaleup for blending and motion, solids suspension, gas dispersion, and viscous operations; experimental, computational, and design tools of agitation; static mixing; and mixing with chemical reaction.
Prerequisite(s): CME 465 or permission of instructor.

CME 562 PHYSICAL AND CHEMICAL WASTEWATER TREATMENT PROCESSES 3

Designing of physical and chemical unit processes to treat wastewater originating primarily from industrial sources. Industry pretreatment technologies and the basis for their development.
Prerequisite(s): (CHM 123; CME 465) or permission of instructor.

CME 563 HAZARDOUS WASTE ENGINEERING 3

The fundamental principles of the design and operation of hazardous waste remediation processes. Characterizing contaminated sites and conducting treatability studies to select remediation strategies.
Prerequisite(s): (CHM 123; CME 465) or permission of instructor.

CME 564 SOLID WASTE ENGINEERING 3

Characterizing solid waste. Managing solid waste collection, transport, minimization, and recycling. The design of solid waste disposal and resource recovery facilities.
Prerequisite(s): (CHM 123; CME 411) or permission of instructor.

CME 565 FUNDAMENTALS OF COMBUSTION 3

Flames and combustion waves, detonation waves in gases, the chemistry of combustion, combustion of hydrocarbons, special aspects of gaseous combustion, combustion in mixed and condensed phases, explosions in closed vessels, and combustion and the environment.
Prerequisite(s): (CME 311 or 406) or permission of instructor.

CME 574 FUNDAMENTALS OF AIR POLLUTION ENGINEERING I 3

Air pollution; combustion fundamentals; pollutant formation and control in combustion; pollutant formation and control methods in internal combustion engines; particle formation in combustion.
Prerequisite(s): ((CME 305 or MEE 301, 302); (CME 324 or MEE 410)) or permission of instructor.

CME 575 FUNDAMENTALS OF AIR POLLUTION ENGINEERING II 3

Review of the concepts of air pollution engineering; aerosols; removal of particles from gas streams; removal of gaseous pollutants from effluent streams; optimal air pollution control strategies.
Prerequisite(s): CME 574 or permission of instructor.

CME 576 ENVIRONMENTAL ENGINEERING SEPARATION PROCESSES 3

Discussion of the unit operations associated with environmental engineering separation processes of solid-liquid, liquid-liquid, and gas-liquid systems; general use, principles of operation, and design procedures for specific types of equipment.
Prerequisite(s): Permission of instructor.

CME 581 ADVANCED CHEMICAL ENGINEERING CALCULATIONS I 3

Applications of ordinary and partial differential equations to engineering problems. Classical methods of solution.
Prerequisite(s): MTH 219 or permission of instructor.

CME 582 ADVANCED CHEMICAL ENGINEERING CALCULATIONS II 3

Analyses and solutions of engineering problems described by differential equations. Numerical methods of solution.

CME 583 PROCESS MODELING 3

Mathematical description of physical and chemical processes, solution methods, and prediction interpretation. Engineering applications.
Prerequisite(s): CME 582 or equivalent.

CME 586 INTRODUCTION TO PETROLEUM ENGINEERING 3

Introduction to the fundamental concepts in petroleum engineering. Petroleum topics include overviews of areas such as petroleum geology, petroleum fluids and thermodynamics, drilling and completion, and production and multiphase flow. In addition this course will cover refinery operations. Second term, each year.
Prerequisite(s): Permission of instructor.

CME 590 INTRODUCTION TO BIOENGINEERING I 3

Overview of biomedical engineering, transport phenomena in physiological systems, kinetic and reactor modeling for physiological systems, overview of biochemical engineering, bioreactors, bioseparation processes.
Prerequisite(s): (CHM 420 or 451); (CME 325, 365).
Corequisite(s): CME 406 or permission of instructor.

CME 591 BIOMEDICAL ENGINEERING I 3

Introduction to the fundamental concepts in biomedical engineering with a special focus on chemical engineering applications. Biomedical topics include overviews of areas such as biomaterials, tissue engineering, biosensors and biomedical engineering technology. Second term, each year.
Prerequisite(s): BIO 151 or (CHM 420 or 451) or (CME 324, 365) or permission of instructor.

CME 592 CHEMICAL SENSORS AND BIOSENSORS 3

Analysis performed with chemical sensors complement laboratory analyses and offer the potential for more rapid and on-line analyses in complex sample matrices. The demand for new chemical sensors, biosensors, and sensing concepts is rapidly increasing and associated with the growing need to understand and/or control complex chemical and biochemical processes or detect the presence of toxic chemical or biological agents.

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Prerequisite(s): Permission of instructor.

CME 599 THESIS 1 - 6

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College of Arts and Sciences

(CHM) Chemistry (Collapse Description)

David W. Johnson, Interim Chair of the Department
Kevin M. Church, Director of MS Program

The Department of Chemistry offers graduate programs leading to the Master of Science in chemistry.

The purpose of the master's program in chemistry is to present a rigorous approach to modern chemical theories and research.

The student and advisor determine the composition of the program of study with the approval of the graduate committee. All candidates for the Master of Science are required to submit proof of their ability to do independent work. Normally, this proof takes the form of a research thesis. Additional coursework may be substituted if the student has previously demonstrated research proficiency commensurate with a master's degree as judged by the graduate committee.

Assistantships

Teaching assistantships requiring a maximum of nine hours of laboratory instruction per week are available. The stipend for a 9 to 12 month appointment is supplemented by tuition remission for graduate coursework. Appointment as a teaching assistant requires fluency in spoken English. Research assistantships in selected areas are sometimes available.

Programs

Program Name

Master of Science in Chemistry (CHM)

A minimum of 30 semester hours of graduate coursework is required for the Master of Science. This includes 21-24 semester hours of coursework and 6-9 hours of research. The student and advisor determine the composition of the program of study with the approval of the graduate committee. All candidates for the Master of Science are required to submit proof of their ability to do independent work. Normally, this proof takes the form of a research thesis. Additional coursework may be substituted if the student has previously demonstrated research proficiency commensurate with a Master's degree as judged by the graduate committee.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
CHM 502	PHYSICAL CHEMISTRY	3

A concise treatment of theoretical chemistry.
Prerequisite(s): CHM 124.

Code	Title	Sem. Hrs.
CHM 504	SPECIAL TOPICS IN THEORETICAL CHEMISTRY	3

Treatment of topics selected from those normally surveyed in a one-year undergraduate course in physical chemistry such as electrochemistry, symmetry, spectroscopy, polymers, or others.
Prerequisite(s): (CHM 304; MTH 218) or equivalent.

CHM 507 SPECTROSCOPIC IDENTIFICATION OF ORGANIC COMPOUNDS 1

The use of nuclear magnetic resonance, infrared, and mass spectrometry in elucidating structures. Emphasis on interpretation and integration of spectral data in problem solving.
Prerequisite(s): (CHM 314, 314L) or equivalent.

CHM 512 INTERMEDIATE ORGANIC CHEMISTRY 3

Modern theory of organic chemistry and reaction mechanisms.
Prerequisite(s): CHM 314 or equivalent.

CHM 515 ANALYTICAL CHEMISTRY 2

Methods of analysis based on modern instrumentation including chemical, electrical, and spectral methods.
Prerequisite(s): CHM 201 or 302 or 304.

CHM 515L ANALYTICAL CHEMISTRY LABORATORY 1

A laboratory course to accompany CHM 515.

CHM 517 INORGANIC CHEMISTRY 3

An introductory course. The fundamentals of modern inorganic chemistry including atomic structure, principles of structure and bonding, acid-based chemistry, periodicity, coordination compounds, nonaqueous solvents, electrochemistry, molecular symmetry, and the chemistry of representative elements.

CHM 525 PRINCIPLES OF ORGANIC CHEMISTRY 3

An introduction to the fundamentals of organic chemistry.
Prerequisite(s): CHM 124.

CHM 525L PRINCIPLES OF ORGANIC CHEMISTRY 1

Laboratory course to accompany CHM 525-526. One three-hour laboratory per week.

CHM 526 PRINCIPLES OF ORGANIC CHEMISTRY 3

An introduction to the fundamentals of organic chemistry.
Prerequisite(s): CHM 124.

CHM 526L PRINCIPLES OF ORGANIC CHEMISTRY 1

Laboratory course to accompany CHM 525-526. One three-hour laboratory per week.

CHM 527 THEORETICAL PRINCIPLES OF CHEMISTRY 3

Prerequisite(s): MTH 218.

CHM 527L THEORETICAL PRINCIPLES OF CHEMISTRY 1

Laboratory course to accompany CHM 527-528. One three-hour laboratory per week.

CHM 528 THEORETICAL PRINCIPLES OF CHEMISTRY 3

Prerequisite(s): MTH 218.

CHM 528L THEORETICAL PRINCIPLES OF CHEMISTRY 1

Laboratory course to accompany CHM 527-528. One three-hour laboratory per week.

CHM 539 SPECIAL TOPICS IN PHYSICAL CHEMISTRY 3

Topics of current interest in areas such as chemical instrumentation, electronics, physical biochemistry, macromolecular chemistry, and spectroscopy.

CHM 541 TOPICS IN PHYSICAL CHEMISTRY 3

Modern aspects of physical chemistry, which may include the solid state, electrochemistry, or mathematical methods of physical chemistry.

CHM 544 COORDINATION CHEMISTRY 3

Properties of transition metal ions, reaction mechanisms in coordination compounds, bioinorganic systems, electron transfer mechanisms, and the experimental tools common to coordination chemistry.
Prerequisite(s): CHM 517 or equivalent.

CHM 546 SPECIAL TOPICS IN MODERN ANALYTICAL CHEMISTRY 3

Modern analytical methods. Subject matter may include NMR, EPR, electroanalytical methods, GLC, mass spectrometry, IR and Raman spectroscopies, visible and ultraviolet spectrophotometric methods, X-ray techniques, ESCA and Auger spectroscopies, atomic absorption, and fluorescence.

CHM 550 SPECIAL TOPICS IN ORGANIC CHEMISTRY 3

Modern physical organic chemistry, spectroscopy, photochemistry, molecular rearrangements, stereochemistry, and natural products.

CHM 551 GENERAL BIOCHEMISTRY I 3

Discussion of the chemistry and biochemistry of carbohydrates, amino acids, proteins, and nucleic acids, including health-science and methodologic aspects. Descriptions of enzymology, protein purification, and carbohydrate metabolism related to such topics as bioenergetics, membranes, and disease processes.
Prerequisite(s): CHM 201, 314.

CHM 552 GENERAL BIOCHEMISTRY II 3

Discussion of selected topics in bioenergetics, and metabolism of lipids, amino acids, porphyrins, nucleic acids, and proteins. Current aspects of nutrition, biochemical genetics, endocrinology, regulation, and genetic engineering are addressed and related to health-science topics as time permits.
Prerequisite(s): CHM 551.

CHM 553 TOPICS IN BIOCHEMISTRY 1 - 3

Topics of current interest in biochemistry.
Prerequisite(s): (CHM 551 or 552) or permission of instructor.

CHM 554 DIRECTED READINGS 1 - 3

CHM 560 RESEARCH 0 - 9

CHM 561 RESEARCH 0 - 9

CHM 562L INTRODUCTORY BIOCHEMISTRY LABORATORY 2

Spectrophotometry; pH and dissociation; thin-layer, column, and paper chromatography; enzymology and enzyme purification, quantitative and qualitative techniques for studying proteins, amino acids, lipids, carbohydrates, and nucleic acids; and radioisotopic tracer techniques.
Prerequisite(s): CHM 551 or permission of instructor.

CHM 590L SCIENTIFIC GLASSBLOWING 1

Theory and practice of glass working. Under the supervision of a professional glassblower, students learn to make several standard seals and fabricate pieces of glass apparatus. Enrollment limited. One three-hour laboratory each week.
Prerequisite(s): Permission of department chairperson.

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School of Engineering

(CEE) Civil and Environmental Engineering (Collapse Description)

Fairis A. Malhas, Chair of the Department

Programs

Program Name

Master of Science in Civil Engineering (CEE)

The program of study for the degree of Master of Science in civil engineering, developed in cooperation with an advisor assigned by the department chair, must include a minimum of 30 semester hours consisting of the following:

1. Fifteen to eighteen semester hours in civil engineering, engineering mechanics, and/or thesis-related courses selected from one of the following areas of concentration:
   - engineering mechanics
   - environmental engineering
   - geotechnical engineering
   - structural engineering
   - transportation engineering
   - water resources engineering
2. Six to nine semester hours of engineering or basic science electives to be chosen from current course offerings. For the major concentration of engineering mechanics, six semester hours of mathematics (MTH 535 and 551) must be selected.
3. Six semester hours of research on a civil engineering thesis (CEE 599). Upon request of the student, and with the approval of the faculty advisor and the department chair, the six thesis hours may be replaced with six hours of coursework plus three hours of project (CEE 598). A final oral examination is required upon completion of the thesis or project.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the advisor.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
CEE 500	ADVANCED STRUCTURAL ANALYSIS	3

Frames of variable cross section; arches; flat and folded plates; elastic stability of columns, frames, and plates; cylindrical, spherical, and barrel shells; structural dynamics of beams and frames.
Prerequisite(s): CEE 317.

Code	Title	Sem. Hrs.
CEE 501	STRUCTURAL ANALYSIS BY COMPUTER	3

Review of force and displacement methods. Introduction to direct element and substructure methods. Students write and execute computer programs to analyze plane and space trusses, grids, and frames.
Prerequisite(s): CEE 317.

Code	Title	Sem. Hrs.
CEE 502	PRESTRESSED CONCRETE	3

Discussion of the properties of concrete and prestressed steel. Theory and design of prestressed concrete beams, slabs, columns, frames, ties, and circular tanks.
Prerequisite(s): CEE 412.

CEE 503 INTRODUCTION TO CONTINUUM MECHANICS 3

Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics.
Prerequisite(s): EGM 303.

CEE 504 STRUCTURAL DYNAMICS 3

Response of undamped and damped single and multi-degree-of-freedom structures subjected to harmonic, periodic, and general dynamic loadings. Special topics include nonlinear structural response, response spectra, shear buildings, and simple systems with distributed properties.
Prerequisite(s): CEE 317 or permission of instructor.

CEE 505 PLASTIC DESIGN IN STEEL 3

Analysis and design procedures based on ultimate load capacity applied to steel beams, frames, and their connections. Concept of plastic hinge, necessary conditions for the existence of plastic moment, instability, deformations, repeated and reversed loading, and minimum weight design.
Prerequisite(s): CEE 411.

CEE 507 MASONRY DESIGN 3

Properties and performance criteria of bricks, concrete blocks, mortar and grout; codes and construction practices; design of masonry elements.
Prerequisite(s): CEE 317.

CEE 508 DESIGN OF TIMBER STRUCTURES 3

Study of basic wood properties and design considerations. Design and behavior of wood connectors, fasteners, beams, columns, and beam columns. Introduction to plywood and glued laminated members. Analysis and design of structural diaphragms and shear walls.
Prerequisite(s): CEE 317.

CEE 511 EXPERIMENTAL STRESS ANALYSIS 3

A study of the experimental analysis of stress as an aid to design for strength and economy with emphasis on electrical strain gages. Also, photoelasticity, brittle coatings, analogies, structural similitude. Two hours lecture and one three-hour laboratory period per week.
Prerequisite(s): EGM 303.

CEE 515 PAVEMENT DESIGN, CONSTRUCTION & MANAGEMENT 3

Fundamental principles of flexible and rigid highway and airport pavement design, construction, and management.

CEE 520 ADVANCED GEOTECHNICAL ENGINEERING 3

Advanced study of Geotechnical engineering principles and study. Stress-strain characteristics; constitutive relationships; failure theories; dynamic soil properties; difficult soils; soil improvement; stability of earth slopes.
Prerequisite(s): CEE 312.

CEE 524 FOUNDATION ENGINEERING 3

Application of Geotechnical engineering principles of analysis and design of shallow and deep foundations and earth retaining structures. Topics include site exploration and characterization, foundation types, bearing capacity, settlement analysis, shallow foundation design, earth pressures theories, design of retaining walls, flexible retaining structures and braced excavations, design of pile foundations and drilled piers.
Prerequisite(s): CEE 312.

CEE 533 THEORY OF ELASTICITY 3

Three-dimensional stress and strain at a point; equations of elasticity in Cartesian and curvilinear coordinates; methods of formulation of equations for solution, plane stress and plane strain, energy formulations, numerical solution procedures.
Prerequisite(s): EGM 303.
Corequisite(s): EGM 503.

CEE 534 THEORY OF PLATES AND SHELLS 3

Theory of plates; small and large displacement theories of thin plates; shear deformation; buckling; sandwich plate theory. Thin shell theory; theory of surfaces; thin shell equations in orthogonal curvilinear coordinates; bending, membrane, and shallow shell theories.
Prerequisite(s): EGM 533.

CEE 535 ADVANCED MECHANICAL VIBRATIONS 3

Review of undamped, damped, natural, and forced vibrations of one and two degrees of freedom systems. Lagrange's equation, eigenvalue/eigenvector problem, modal analysis for discrete and continuous systems. Computer application for multi-degree of freedom, nonlinear problems.
Prerequisite(s): MEE 319; computer programming.

CEE 539 THEORY OF PLASTICITY 3

Fundamentals of plasticity theory including elastic, viscoelastic, and elastic-plastic constitutive models; plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures.
Prerequisite(s): EGM 503 or 533.

CEE 540 COMPOSITE DESIGN 3

Design with composite materials. Micromechanics. Lamination theory. Joining. Fatigue. Environmental effects.
Prerequisite(s): EGM 303.

CEE 541 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3

Introduction to the mechanical response of fiber-reinforced composite materials with emphasis on the development of experimental methodology. Analytical topics include stress-strain behavior of anisotropic materials, laminate mechanics, and strength analysis. Theoretical models are applied to the analysis of experimental techniques used for characterizing composite materials. Lectures are supplemented by laboratory sessions in which characterization tests are performed on contemporary composite materials.
Prerequisite(s): EGM 303.

CEE 543 ANALYTICAL MECHANICS OF COMPOSITE MATERIALS 3

Analytical models are developed for predicting the mechanical and thermal behavior of fiber-reinforced composite materials as a function of constituent material properties. Both continuous and discontinuous fiber-reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micromechanics and lamination theory, free edge effects, and failure criteria.
Prerequisite(s): EGM 303.

CEE 544 MECHANICS OF COMPOSITE STRUCTURES 3

Comprehensive treatment of laminated beams, plates, and sandwich structures. Effect of heterogeneity and anisotropy on bending under lateral loads, buckling, and free vibration are emphasized. Shear deformation and other higher-order theories and their range of parametric applications are also considered.
Prerequisite(s): EGM 543 or permission of instructor.

CEE 546 FINITE ELEMENT ANALYSIS I 3

Fundamental development of the Finite Element Method (FEM), and solution of field problems and comprehensive structural problems. Variational principles and weak, forms; finite element discretization; shape functions; finite elements for field problems; bar, beam, plate, and shell elements; isoparametric finite elements, stiffness, nodal force, and mass matrices; matrix assembly procedures; computer coding techniques; modeling decisions; program output interpretation. Emphasis on a thorough

understanding of FEM theory and modeling techniques.
Prerequisite(s): CEE 503 or 533.

CEE 550 HIGHWAY GEOMETRIC DESIGN 3

Advanced topics in horizontal and vertical alignment design controls and criteria, sight distance, intersection and interchange design.
Prerequisite(s): CEE 403.

CEE 551 TRAFFIC ENGINEERING 3

Characteristics of traffic, including the road user, vehicle, traffic control devices, accident analysis, signal operations and design and the fundamentals of signal system progression.
Prerequisite(s): CEE 403.

CEE 552 INTELLIGENT TRANSPORTATION SYSTEMS 3

Fundamentals of planning, design, deployment and operations of ITS. Integrated application of ITS architecture, traffic flow principles, advanced equipment, communications technologies and management strategies to provide traveler information and increase the safety and efficiency of the surface transportation system.
Prerequisite(s): CEE 403.

CEE 558 TRAFFIC ENGINEERING RESEARCH 3

Practical problems in control or capacity restraints based on studies of actual local situations.
Prerequisite(s): CEE 403.

CEE 560 WASTEWATER ENGINEERING 3

Measuring the characteristics and estimating the quantity of wastewater produced from domestic and industrial sources. Principles of designing and operating wastewater treatment plants that primarily use microbiological treatment processes. Process selection criteria will be emphasized.

CEE 562 PHYSICAL AND CHEMICAL WASTEWATER TREATMENT PROCESSES 3

Designing physical and chemical unit processes to treat wastewater. Industry pretreatment technologies and the basis for their development.

CEE 563 HAZARDOUS WASTE ENGINEERING 3

Characterizing contaminated sites and conducting treatability studies to select remediation strategies.

CEE 564 SOLID WASTE ENGINEERING 3

Characterizing solid waste. Managing solid waste collection, transport, minimization, and recycling. The design of solid waste disposal and resource recovery facilities.

CEE 570 CEE COMPUTER APPLICATIONS 3

Innovative solutions to common civil engineering problems in environmental, geotechnical, structures, transportation, and water resources through the use of personal computer applications.
Prerequisite(s): CEE 320.

CEE 574 FUNDAMENTALS OF AIR POLLUTION ENGINEERING I 3

Air pollution, combustion fundamentals, pollutant formation and control in combustion, pollutant formation and control methods in internal combustion engines, particle formation in combustion.
Prerequisite(s): ((CME 311 or MEE 301); (CME 324 or MEE 410)) or permission of instructor.

CEE 575 FUNDAMENTALS OF AIR POLLUTION ENGINEERING II 3

Review of the concepts of air pollution engineering; aerosols; removal of gaseous pollutants from effluent streams; optimal air pollution control strategies.
Prerequisite(s): CME 574 or permission of instructor.

CEE 576 ENVIRONMENTAL ENGINEERING SEPARATION PROCESSES 3

Discussion of the unit operations associated with environmental engineering separation processes of solid-liquid, liquid-liquid, and gas-liquid systems; general use, principles of operation, and design procedures for specific types of equipment.
Prerequisite(s): Permission of instructor.

CEE 580 HYDROLOGY AND SEEPAGE 3

Detailed study of the hydrologic cycle with a focus on rainfall/runoff generation techniques. Practical application of hydrologic fundamentals is demonstrated through the design of urban storm water systems. Introduction to sub-surface hydrology and groundwater modeling.
Prerequisite(s): CEE 312.

CEE 582 ADVANCED HYDRAULICS 3

Detailed examination of unsteady flow in closed-conduits and open channels. Practical methods for solving waterhammer and flood routing problems are presented. Physical modeling integrated with dimensional analysis and similitude is presented.
Prerequisite(s): CEE 313, 333.

CEE 584 OPEN CHANNEL FLOW 3

Open channel flow in its various forms will be studied. Major topics to be covered include energy and momentum principles, uniform and gradually varied flow, rapidly varied flow, spatially varied flow and an introduction to unsteady flow. Pragmatic applications such as channel design, water surface profile computations, and culvert analysis will also be covered. Well-established solution approaches and widely accepted computer methods will be used to solve real-world problems.
Prerequisite(s): CEE 313, 333.

CEE 590 SELECTED READINGS IN CIVIL ENGINEERING 1 - 3

Directed readings in a designated area arranged and approved by the student's faculty advisor and the department chair. May be repeated.

CEE 595 SPECIAL PROBLEMS IN CIVIL ENGINEERING 1 - 6

Special assignments in civil engineering subject matter to be arranged and approved by the student's advisor and the department chair.

CEE 598 PROJECT 1 - 6

CEE 599 THESIS 1 - 6

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the Bulletin
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→ Explore a Different Issue

College of Arts and Sciences

(COM) Communication (Collapse Description)

Don Yoder, Interim Chairperson

James D. Robinson, Director of Graduate Studies

The graduate program of the Department of Communication leads to the Master of Arts.

The focus of the Department of Communication is upon symbolic processes in human communication. Such a focus is distinguished by the contributions of scholars in rhetoric, communication theory, and mass communication. A solid grounding in research, theory, message development and analysis will prepare graduates to begin or advance their careers in education, business, mass media, and government.

The master's student should begin study in the Department of Communication with the standard undergraduate competencies. If the student lacks such competencies, they should be developed prior to attempting the master's program. Students receiving the master's degree from the Department of Communication must:

1. Have a thorough grounding in theories relevant to a particular area of interest, and have the ability to apply this knowledge to the solution of a variety of communication-related problems;
2. Have been exposed to a variety of research and analytical or critical methods, have a basic understanding of these, and have demonstrated a working command of at least one methodology; and
3. Have a basic knowledge of and appreciation for approaches to the study of communication from a variety of perspectives.

Assistantships

Graduate assistantships are available. The assistantships carry a stipend and tuition remission for courses required for the degree. The assistantships are for one year with possible renewal for one additional year. No student can receive an assistantship for more than two academic years.

Assistantships in the department are, for the most part, teaching assistantships. However, some assistantships may carry a reduced teaching load when combined with other departmental responsibilities such as faculty research assistance.

The minimum requirements for assistantship in the department are:

1. The equivalent of an academic minor in communication and related areas or a demonstrated successful professional background in a communication-oriented occupation for a minimum of three years.
2. A 3.0 undergraduate cumulative point average (or the equivalent) and a 3.0 in the academic major or minor (communication).
3. Admission to the master's degree program in communication on regular status.

Advising

The advisor serves the student in planning the program of study, supervising the administration of comprehensive examinations, and (when appropriate) directing the student's thesis project.

The graduate program director serves as a temporary advisor to assist the student with initial enrollment and program planning. The student should choose a permanent advisor from among available communication faculty before the middle of the second semester (or completion of nine semester hours). The student must gain approval from the faculty member and the program director before the faculty member will be appointed as permanent advisor. Subsequent changes of advisor require approval of the program director.

After consultation with the permanent advisor, the student should submit a proposed program plan (on the forms provided by the program director) no later than the end of 12 semester hours. A copy of the proposed program should be on file in the program director's office.

The advisor will conduct a mid-program review of the student's progress toward the degree. The time of this review should be specified during the initial program planning meeting; however, it should take place by the time 15 semester hours are completed.

Programs

Program Name

Master of Arts in Communication (COM)

General Requirements

All students enrolled in the program are subject to the following general requirements.

1. The number of semester hours as specified by the program options described below.
2. All students must complete the following core requirements: COM 501, COM 536, COM 502 or COM 503, COM 517 or COM 571.
3. Demonstration of satisfactory progress toward the degree which includes the requirement that students maintain a minimum average of B (3.0) in coursework. Students who fail to meet this requirement will be dismissed from the program.
4. Students are permitted no more than six semester hours with grades of C or lower. Students who fail to meet this requirement will be dismissed from the program.
5. It is the student's responsibility to know and to meet the requirements of the University and of the Department of Communication graduate program.

NOTE: It is expected that each master's students will enroll in the required core courses as early as possible.

Program A-Communication Non-Thesis Option

Program A consists of 36 semester hours of coursework, of which 24 semester hours must be from the Department of Communication. Students who choose Program A are required to successfully complete the core requirements as early as possible in the academic program. Students in Program A are encouraged to complete a capstone project or independent study project in their final semester of coursework.

All students choosing Program A must take the comprehensive examination during their last semester of classes. (See the subsequent section on Comprehensive Examination for more information.)

Program B-Communication Thesis Option

Program B consists of 30 to 33 semester hours of coursework, 18 semester hours of which must be from the Department of Communication. In addition, students complete three to six credit hours of Thesis (COM 598 and/or COM 599). Students choosing to write a thesis must complete the comprehensive examination during their final term of coursework. (See the subsequent section on Comprehensive Examination for more information.)

The student will select a thesis committee consisting of the advisor and at least two other faculty members. (One of the faculty members may be from outside the Department of Communication.) Students may register for three semester hours of Thesis (COM 598) during the term that the prospectus will be presented to the thesis committee for approval.

The thesis should report original research on some important question relevant to the study of communication. The prospectus should also include a detailed description of the research methods to be used as well as suggested analytic techniques.

The prospectus will be developed in consultation with the thesis advisor, although the student must have the methodological competence necessary to complete the proposed project. Once the prospectus is approved by the advisor, it must be presented to the thesis committee for approval. The completed prospectus will

constitute the first half of the thesis and serves, essentially, as a contract between the student and the committee.

After the prospectus has been approved, the student may register for an additional three hours of thesis credit while completing the thesis (COM 599). The student will then collect and analyze the data required to answer the questions raised in the prospectus. Once this has been completed, the prospectus will become the first half of the thesis, followed by a chapter reporting the results of the study and a chapter discussing the implications of those results. The thesis will be revised until the advisor considers it satisfactory, at which time it will be presented to the members of the thesis committee by the student, who will orally defend the thesis in an examination conducted by the thesis committee. The master's degree is not completed until the thesis has been approved by the committee.

Should a student fail the final oral defense, the thesis may be defended again, provided the student's thesis committee recommends a second attempt. The second attempt to defend the thesis will be final. Failure of the second oral defense will require a majority vote of the student's thesis committee.

Program C-Communication/Interdisciplinary

Courses in business administration, English, psychology, and political science have been designated for Communication/Interdisciplinary study leading to the Master of Arts.

Students take 36 semester hours of coursework; 24 of those hours must be in communication and 12 in one of the interdisciplinary areas. Students who choose Program C are required to successfully complete the core requirements. All students choosing Program C must take the comprehensive examination during their last semester of classes. (See the subsequent section on Comprehensive Examination for more information.)

Program D - 5 Year BA + MA

A five-year BA+MA program in communication is also available. Communication majors maintaining a 3.2 overall GPA are invited to apply during their junior year. Students accepted into the program will take two graduate courses during their senior year. These six credits will count toward their MA degree as well as toward their BA degree. Contact the Director of Graduate Studies at (937) 229-2028 for further information about the program.

Comprehensive Examination

After consulting with the Program Director and advisor, the student selects faculty members (with their approval) to form an examination committee. The examination committee writes the examination questions, evaluates the student's written answers, and conducts the oral examination. Normally, at least three faculty members write questions and evaluate the comprehensive exam. The advisor may or may not participate in the writing and evaluating of exam questions. One of the members of the examination committee may be from outside the Department of Communication. The advisor administers the examination.

The comprehensive examination consists of a written examination at least six hours in length and a one-hour oral defense. The form and content of the exam is determined by the advisor and the faculty examination committee.

Written Examination

The written examination covers the coursework completed by the student, including both research methods and communication theory. The particular topic areas covered, and the number of hours of examination devoted to each topic area are determined by the student, the advisor, and the examination committee.

The exam will be written without notes, at a time and place specified by the Program Director. Specific resource materials may be permitted only if indicated by the examiner on the test question.

Oral Examination

After satisfactory completion of the written examination, the student will defend answers in an oral examination. Students prepare for the oral examination by consulting the advisor and examination committee concerning performance on the written exam.

Under extreme circumstances, an oral exam may be retaken once, only if recommended by the committee. Generally, prior to retaking the oral exam, the student must complete either additional coursework or a research paper. A student who has already taken additional classes and written a research paper will be dismissed from the program. Failure of the second oral exam will result in

dismissal.

Courses **(Collapse All Courses)**

Code	Title	Sem. Hrs.
COM 501	COMMUNICATION RESEARCH AND METHODS	3

Introduction to the study of communication research and methods. Required course for all communication graduate students.

COM 502	RHETORICAL CRITICISM	3

Critical survey and application of traditional to contemporary methods of rhetorical criticism.

COM 503	COMMUNICATION RESEARCH SEMINAR	3

Focused study on the methods and process of conducting communication-related research. Builds upon fundamentals covered in COM 501. **Prerequisite(s):** COM 501.

COM 504	PRINCIPLES OF COMMUNICATION EDUCATION	3

Practical application of research, theory, and principles related to communication education. Development of students' pedagogical skills and strategies. Required course for graduate teaching assistants.

COM 506	ETHICS OF COMMUNICATION	3

Investigation and application of the general ethical principles of persuasion and the special problems related to professional areas: platform and business communication, electronic and print journalism, public relations, classroom communication, and forensic behavior.

COM 508	INTERPERSONAL COMMUNICATION	3

Focus on the theories, concepts, constructs, and research related to the process of interpersonal communication.

COM 511	THEORIES OF PERSUASION	3

An examination of the major approaches to the study of persuasion from classical rhetorical to contemporary behavioral theorists.

COM 515	LANGUAGE AND MEANING	3

Focuses on the origin and development of language and meaning. Comprehensive exploration of the many perspectives and theories of language and meaning.

COM 517	ORGANIZATIONAL COMMUNICATION	3

A study of communication activities within organizations: theories and systems of organizational communication, internal communication systems, research methods, and the interface of management and communication.

COM 520	PUBLIC COMMUNICATION CAMPAIGNS	3

Investigation of noncommercial public communication campaigns concentrating on social change or public information. Analysis and development of campaigns through mass media, organizational, group and interpersonal communication.

COM 525	COMMUNICATION TRAINING & DEVELOPMENT	3

Explores the theories, methods, and practice of developing, instituting, and evaluating communication training and development programs.

COM 526	COMMUNICATION CONSULTING	3

Explores the theories, methods, and practice of developing, instituting, and evaluating communication consulting programs.

COM 527	SMALL GROUP COMMUNICATION	3

An examination of the theoretical and practical aspects of small group communication. Focus on communication as it relates to decision making, group processes, leadership and roles, and member relations.

COM 530 DEVELOPMENT OF MASS MEDIA 3

History and analysis of the development and interdependence of mass media, print and electronic. Emphasis on its role and responsibility in political and economic progress of the U.S.

COM 531 DIRECTED STUDY IN COMMUNICATION 1 - 3

An intensive study of a specialized area of communication selected through consultation with the instructor. Permission. May be repeated for up to six semester hours.

COM 536 THEORIES AND MODELS OF COMMUNICATION 3

Survey and analysis of current theories and models of communication. Required course for all communication graduate students.

COM 537 CONFLICT MANAGEMENT 3

An analysis of the role of communication in the process of conflict, with special emphasis on communication strategies for managing conflict. Special focus on types of conflict, conflict contexts, power, and communication style.

COM 547 SEMINAR IN HEALTH COMMUNICATION 3

An examination of communication theory and research related to health care. Issues include reassurance, the role of the patient, interviews, health organizations, the media and health, compliance, providing explanations, and health care professions frequently neglected.

COM 555 PUBLIC RELATIONS 3

Focuses on the theoretical principles behind the current-day practice of public relations. Special emphasis on public opinion, diffusion, persuasion, problem analysis, and audience assessment within the PR context.

COM 562 TOPICS IN COMMUNICATION 3

Selected topics in communication, for example: argumentation, listening, law and the news media, historical and contemporary public address and criticism. Repeated when topic and instructor change.

COM 571 MASS COMMUNICATION PROCESSES AND EFFECTS 3

An examination of the historical and current research as it relates to our understanding of the processes and effects of mass communication.

COM 598 THESIS 3

COM 599 THESIS 3

COM 617 ORGANIZATIONAL RHETORIC AND SYMBOLISM 3

Examination of discourse and symbolism as the principal communicative media through which organizational power relations are maintained and reproduced, member meanings are created, and organizational culture is enacted.

COM 620 ELECTION CAMPAIGN COMMUNICATION 3

Survey of communication research and theories concerning election campaign communication including candidates, voters and the media. Analysis of campaign communication including development of appropriate research methodologies.

COM 622 PROPAGANDA ANALYSIS 3

An examination of the foundations of modern propaganda analysis. Topics include classical rhetorical contributions to argumentative analysis; historical development of propaganda; points of propaganda analysis. Special emphasis on modern mediated propaganda from World War I to the present.

COM 630 ISSUES IN INTERNATIONAL COMMUNICATION 3

Discussion of current issues in international communication. Possible topics include international news flow, globalization of mass media, communication and development, comparative mass media, mass media in political revolutions, democracy and terrorism.

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College of Arts and Sciences

(CPS) Computer Science (Collapse Description)

James P. Buckley, Chair of the Department
Graduate Committee: Dale E. Courte, Joseph E. Lang, Jennifer Seitzer

The graduate program in computer science offers a comprehensive approach to the theory and application of computer science. Graduates of the program will have:

1. a thorough grounding in the theory of computing science and the ability to apply that knowledge to a variety of problem areas,
2. been exposed to a variety of analytical methods and will demonstrate a basic understanding of those methods, and
3. been exposed to a wide breadth of computer science information by having studied several of the dominant sub-disciplines of computer science.

The program is individualized to meet each student's needs and provides a firm foundation for continuing on to the doctorate or a professional career. The program accommodates both full-time and part-time students.

Assistantships

Graduate assistantships are offered to qualified students for assisting with introductory computer science courses and assisting faculty with research. Competent assistants making satisfactory progress toward the degree can normally renew their assistantships for a second year. Recipients are expected to complete the requirements for the master's degree in two years. Assistants contribute half-time service of 20 hours per week. Stipends and complete tuition remission for six semester hours per term are provided. Detailed information and application forms may be obtained from the Department of Computer Science.

Facilities

Two types of computing facilities are available to students: those provided by the university (through UDit, Academic Technology Services) and those provided by the Department of Computer Science.

The Department of Computer Science has two laboratories in Anderson Center that house the departmental servers and workstations. In addition, the department has a third laboratory with microcomputers and a fourth laboratory for digital design, microcomputer interfacing, and networking.

UDit provides general educational computing facilities to all university students. These facilities include a variety of network services.

All of the computers provide access to a large variety of application packages and programming languages. Around-the-clock telephone dial-up services and access via the internet to all systems are available to students with appropriate access equipment.

Additional Information

See http://www.udayton.edu/~cps/GradFAQs.html/ for additional and recent information on the Department of Computer Science graduate program; see http://gradadmission.udayton.edu for admission requirements for the Department of Computer Science graduate program; see http://gradschool.udayton.edu/ for general information on the University of Dayton Graduate School.

Programs

Program Name

- Master of Computer Science (CPS)

The degree requires 36 semester hours, 24 of which must be taken from computer science courses numbered 510 or above, six of which constitute a final, culminating experience, and six of which are free electives that may be acquired by taking graduate courses of other university departments (or from additional CPS courses numbered 510 or above).

The 24 departmental semester hours include required fundamentals, breadth requirements, and one CPS elective course. Six hours must include CPS 530 and CPS 536; fifteen must include three semester hours from each of the following sub-disciplines of computer science: (1) Software Development Methodologies, (2) Database/Technology, (3) AI/Algorithms, (4) Systems and Architecture, and (5) Languages. The remaining three hours may be acquired by taking any other CPS course numbered 510 or above.

The student must also complete a 6-semester hour final, culminating experience consisting of either (1) a master's thesis, (2) a software engineering project, or (3) two additional CPS courses (numbered 510 or above), which are to be taken from one of the above-listed computer science sub-disciplines. Note: the final six hours must be taken in residence for all students choosing option (3).

Each student's program requires the advance approval of a faculty advisor. A student failing to make normal progress will be required to withdraw from the program.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.

CPS 502 COMPUTING-GENERAL SURVEY 3

A nontechnical introduction to the history and organization of digital computers. Survey of the diverse applications of computers in government, business, education, and the arts. Discussion of the psychological and sociological impact of the computer and information age and related ethical issues. Primarily for students in the humanities and education.

CPS 509 TOPICS IN COMPUTER SCIENCE 1 - 3

Lectures in special areas of interest determined by the department. May be taken more than once for additional credit when the topics or contents change.
Prerequisite(s): Permission of department chairperson.

CPS 510 SYSTEMS ANALYSIS 3

Process-oriented, data-oriented, and object-oriented approaches for systems development; comparison of various systems development life cycles; DFD methodology for systems analysis using state-of-the-art CASE (Computer Aided Software Engineering) tools; logical and event analyses of DFD specifications; tools and techniques for modeling real-time systems; data modeling; introduction to object-oriented analysis methodologies.
Prerequisite(s): CPS 350.

CPS 512 SYSTEMS DESIGN 3

Principles of design, introduction to software design methodologies; issues in transition from analysis to logical and physical designs; detailed discussion of structured design methodology (Yourdon, Constantine, Myers); design guidelines; transform analysis; Warnier/Orr design methodologies; designing methodologies for real-time systems; introduction to object-oriented design; CASE tools and code generators.
Prerequisite(s): CPS 510.

CPS 514 MANAGEMENT INFORMATION SYSTEMS 3

The systems approach to managing information; MIS organization within the company; application of organizational behavior to MIS; manager's view of computer systems; planning, designing, and implementing MIS; advanced concepts of MIS.
Prerequisite(s): CPS 510.

CPS 518 SOFTWARE ENGINEERING 3

Explores major issues of software engineering, comparison of various manual/automated analysis and design methodologies; testing and quality assurance; software metrics and configuration management; software productivity and human factors in software development; CASE tools for various phases of software development.
Prerequisite(s): CPS 350.

CPS 520 OBJECT-ORIENTED SYSTEMS DEVELOPMENT 3

Unified Modeling Language (UML), use cases, class diagrams, sequence diagrams, collaboration diagrams, state charts, activity diagrams, component and deployment views, design patterns, and implementation of various UML models through team projects.
Prerequisite(s): CPS 350, 510.

CPS 522 SOFTWARE PROJECT MANAGEMENT 3

Cost and effort estimation models for software projects, planning techniques, productivity metrics, risk management, maintenance, reuse, quality assurance, configuration management, Capability Maturity Models (CMM and P-CMM), and ISO 9001.
Prerequisite(s): CPS 510 or 518 or 520.

CPS 528 DISCRETE STRUCTURES 3

Survey of various mathematical topics with applications to computer science.

CPS 530 ALGORITHM DESIGN 3

The design and analysis of computer algorithms, including order notation, sorting, dynamic programming, graph algorithms, string matching, matrix multiplication, NP-completeness.
Prerequisite(s): CPS 350.

CPS 532 DATA STRUCTURES 3

Review of basic data concepts, linear lists, strings, arrays, and orthogonal lists, trees and graphs, multilinked structures. Searching and sort techniques. Algorithm design, accessing methods, run time cost and efficiency.
Prerequisite(s): CPS 530.

CPS 536 OPERATING SYSTEMS I 3

Models and algorithms pertinent to the design of computer operating systems; concurrent processes including synchronization, communication and deadlock problems, process and device scheduling policies, design of file systems, reliability and protection.
Prerequisite(s): CPS 350.

CPS 538 OPERATING SYSTEMS II 3

Design and implementation of a multi-user operating system, including concurrent processes, use of monitors and kernels, virtual memory with paging, process synchronization and communication, input and output spooler, interrupts, distributed system concepts.
Prerequisite(s): CPS 536.

CPS 542 DATABASE MANAGEMENT SYSTEMS 3

Physical and logical organization of data files; hierarchical, network, and relational database models; data definition language and data manipulation language of a commercial database management system; query languages.
Prerequisite(s): CPS 350.

CPS 543 COMPARATIVE LANGUAGES 3

The evolution of programming languages. Study of the concepts common to languages, constructs, organization, specification, and analysis of languages. The role of languages in software development.
Prerequisite(s): CPS 350.

CPS 544 SYSTEMS PROGRAMMING I 3

Analysis of compilers and their construction; programming techniques discussed in the current literature; advanced computer applications in both mathematical and nonnumeric areas.

Prerequisite(s): CPS 350.

CPS 545 SYSTEMS PROGRAMMING II 3

Analysis of compilers and their construction; programming techniques discussed in the current literature; advanced computer applications in both mathematical and nonnumeric areas.
Prerequisite(s): CPS 350.

CPS 552 DISCRETE EVENT SIMULATION TECHNIQUES 3

Simulation models; random number generation testing, special purpose simulation languages, statistical analysis of output; regenerative models; trace-driven models. Emphasis on models related to computer operating system design and performance evaluation.
Prerequisite(s): CPS 350; statistics.

CPS 553 NUMERICAL METHODS I 3

Solution of nonlinear equations, interpolation and approximation, differentiation and integration, systems of linear equations, eigenvalues, eigenvectors, and introduction to solution of ordinary differential equations. Emphasis placed on applications.
Prerequisite(s): (CPS 132 or 150); MTH 169.

CPS 554 NUMERICAL METHODS II 3

Solution of nonlinear equations, interpolation and approximation, differentiation and integration, systems of linear equations, eigenvalues, eigenvectors, and introduction to solution of ordinary differential equations. Emphasis placed on applications.
Prerequisite(s): (CPS 132 or 150); MTH 169.

CPS 555 NUMERICAL ANALYSIS I 3

Functional approximation, quadrature methods, numerical solution of differential equations; matrices and large-scale systems, modern iterative matrix methods; minimax approximations; data smoothing.
Prerequisite(s): (CPS 132 or 150); (MTH 302, 319).

CPS 556 NUMERICAL ANALYSIS II 3

Functional approximation, quadrature methods, numerical solution of differential equations; matrices and large-scale systems, modern iterative matrix methods; minimax approximations; data smoothing.
Prerequisite(s): (CPS 132 or 150); (MTH 302, 319).

CPS 560 COMPUTER GRAPHICS 3

Types of graphic hardware and their characteristics. Overview of software and techniques used in computer graphics. Two- and three-dimensional graphics displays.
Prerequisite(s): CPS 350; programming ability in a procedure-oriented language.

CPS 562 DATABASE MANAGEMENT SYSTEMS II 3

Study of query execution and optimization, transaction management, concurrency control, recovery and security techniques. Advanced data models and emerging trends in database systems, like object-oriented database systems, distributed database systems, client-server architecture, multidatabase and heterogeneous systems. Other current database topics and emerging technologies will be discussed.
Prerequisite(s): CPS 542.

CPS 565 ADVANCED COMPUTER ARCHITECTURE 3

Hierarchical memory structure, cache and main memory organization; I/O processors and I/O channels; pipeline computers; array computers, multiprocessor systems and their interconnection structures.
Prerequisite(s): CPS 346 or equivalent.

CPS 570 DATA COMMUNICATIONS 3

The study of networks of interacting computers. The analysis of distributed processing and distributed databases.
Prerequisite(s): CPS 350.

CPS 572 COMPUTER NETWORKING 3

A unified view of the broad field of local area and long haul networks. A survey of the state of the art. Topics covered include networking theory, design approaches, standards, topologies and protocols.
Prerequisite(s): CPS 536, 570.

CPS 577 COMPUTER SYSTEM DESIGN I 3

Introduction to design and analysis of combinational and sequential circuits of MSI devices to design arithmetic and other computer functions. Analysis of a specific microcomputer architecture including usage of its machine and assembler language. Interfacing of various components with computers.
Prerequisite(s): CPS 250.

CPS 578 COMPUTER SYSTEM DESIGN II 3

Introduction to design and analysis of combinational and sequential circuits of MSI devices to design arithmetic and other computer functions. Analysis of a specific microcomputer architecture including usage of its machine and assembler language. Interfacing of various components with computers.
Prerequisite(s): CPS 250.

CPS 580 ARTIFICIAL INTELLIGENCE 3

Presentation of theoretical concepts for artificial intelligence in the areas of knowledge representation and search techniques. These are examined in the context of applications for expert systems, semantic networks, and planning problems. Issues concerning functional programming and logic programming are also presented.
Prerequisite(s): CPS 350.

CPS 581 ADVANCED ARTIFICIAL INTELLIGENCE 3

This course continues the studies pursued in Artificial Intelligence CPS 580. It delves more deeply into certain areas such as multiple agent systems and induction, and introduces new areas, such as neural networks and planning, not covered in CPS 580. As in CPS 580, each student shall complete a final project investigating some area of research in Artificial Intelligence. The project will encompass a literature search, paper, presentation, and implementation.

CPS 582 AUTOMATA THEORY 3

Finite automata, sequential machines. Turing machines, computability, existence of self-reproducing machines.
Prerequisite(s): CPS 528.

CPS 591 SPECIAL RESEARCH PROBLEMS 1 - 3

Individual readings and research in a specialized area. May be taken for at most six semester hours.
Prerequisite(s): Permission of department chairperson.

CPS 592 SPECIAL TOPICS 1 - 3

Lectures and/or laboratory experience in some areas determined by the department.
Prerequisite(s): Permission of department chairperson.

CPS 595 SOFTWARE ENGINEERING PROJECT I 3

First of a two-course project sequence. Students, either individually or in teams, must propose a project, conduct background research, justify the adequacy of the work for a graduate project, complete analysis and design using appropriate methodologies and CASE tools, and write preliminary coding. Students are expected to write code and minimize the usage of visual or other development environments. A minimum of three class presentations is expected for project proposal, progress, and final analysis/design.
Prerequisite(s): (CPS 510, 530); permission of department chairperson.

CPS 596 SOFTWARE ENGINEERING PROJECT II 3

Continuation of CPS 595. Students are required to implement the analysis and design of their projects and make periodic presentations. Special attention needs to be given to the overall architecture of the system, usability, testing, and documentation. A minimum of two class presentations is expected for design and implementation.
Prerequisite(s): CPS 595.

CPS 597 SOFTWARE ENGINEERING PROJECT III 1

This is a continuation of the CPS 595/596 sequence. Students continue progress on the analysis, design, and coding of their Software Engineering Project. A minimum of two class presentations is expected for status and evaluation assessments.
Prerequisite(s): CPS 595, 596.

CPS 598 SOFTWARE ENGINEERING PROJECT IV 1

This is a continuation of CPS 595/596/597 sequence. Students continue progress on the analysis, design, and coding of their Software Engineering Project. A minimum of two class presentations is expected for status and evaluation assessments.
Prerequisite(s): CPS 595, 596, 597.

CPS 599 THESIS 3 - 6

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the Bulletin
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School of Education and Allied Professions

(EDC) Counselor Education and Human Services (Collapse Description)

Thomas W. Rueth, Chair of the Department

The goals of the Department of Counselor Education and Human Services are:

1. To prepare elementary and secondary school counselors; student service personnel in higher education; school psychologists; and counselors for community, mental health and other agency settings to reflect the human service practitioner as a facilitator of individual and community growth.
2. To provide teachers and other helping professionals with specific course offerings designed to build skills and develop understanding relative to identified professional functions within the learning communities. These two missions are conducted at the University of Dayton campus, Lima, Columbus, and other sites as approved.

The department offers seven programs at the graduate level:

1. School Counseling
2. Teacher as Child/Youth Development Specialist
3. College Student Personnel
4. Higher Education Administration
5. Community Counseling
6. Human Development Services
7. School Psychology

In addition, selected courses in behavioral and social science and other related disciplines lead to certification / licensure as a school counselor or school psychologist, as well as to Professional Counselor licensure and Professional Clinical Counselor licensure for social agency personnel. True to Marianist ideals, the faculty are committed to developing the human service practitioner as a skilled facilitator of individual and community growth and as a person knowledgeable of self and children, and youth and adults from varying socioeconomic backgrounds.

Programs (Collapse All)

Program Name

Master of Science in College Student Personnel (EDC)

The master's degree program in college student personnel is designed to assist students in gaining the practice, theoretical perspectives, and appropriate integration to be successful in working on college and university campuses in a variety of positions. The program follows CAS Standards as established by our professional organizations.Coursework emphasizes the development of the professional, working with individual and groups of students, and designing campus environments. Students complete three internships at surrounding colleges and universities. Many of our students hold graduate assistantships in Student Development at the University of Dayton and Wilmington College.

	Sem. Hrs.
College Student Personnel	**35**
Foundational Studies	

EDC 554	INTRODUCTION TO HIGHER EDUCATION AND STUDENT AFFAIRS	3
EDT 672	HISTORY OF HIGHER EDUCATION IN THE UNITED STATES	3
Professional Studies		
EDC 550	STUDENT DEVELOPMENT THEORY	3
EDC 557	STUDENT CULTURES IN THE UNIVERSITY ENVIRONMENT	3
EDC 560	LEADERSHIP IN COLLEGE AND UNIVERSITY ENVIRONMENT	3
EDC 568	RESEARCH AND EVALUATION IN HUMAN SERVICES	3
Advanced Studies		
EDC 551	APPLICATION OF STUDENT DEVELOPMENT THEORY	2
EDC 555	ADMINISTRATION AND ORGANIZATION OF COLLEGE STUDENT PERSONNEL PROGRAMS	3
EDC 562	INTERVENTIONS IN COLLEGE STUDENT PERSONNEL	3
Supervised Practice[1]		
EDC 553	INTERNSHIP IN COLLEGE STUDENT PERSONNEL	2
Electives		2
EDC 574	INDEPENDENT STUDIES IN COUNSELING	1 - 3
EDC 602	COUNSELING SEMINARS	1 - 2
Scholarly Project[2]		
EDC 569	SCHOLARLY PROJECT	3

[1]Students may begin taking internships in their second semester. There are three internships, two semester hours each.

[2]Prerequisite: Final term standing

Master of Science in Community Counseling (EDC)

The 48 semester hour master's program in community counseling is a generalist curriculum that prepares students to pursue counseling licensure. In Ohio, licensure as a professional counselor requires a master's degree in counseling and 60 semester hours of graduate courses. Traditional counseling will be the focus of 40 of the hours, while 20 hours will emphasize clinical counseling with persons who have a diagnosed mental disorder. The master's degree includes all of the traditional coursework and some of the clinical requirements. The 12 semester hour post-master's sequence completes the requirement for clinical counseling coursework. Upon completing the 60 semester hour requirement and passing the required test by the Counseling and Social Work Board, the candidate receives the Professional Counseling License (PC). After completing two additional years of supervised experience, the counselor is licensed as a Professional Clinical Counselor (PCC).

		Sem. Hrs.
Community Counseling		**48**
Human Development		
EDC 500	ORIENTATION TO COMMUNITY COUNSELING	1
EDC 531	PERSONALITY AND HUMAN DEVELOPMENT ACROSS THE LIFESPAN	2
EDC 623[1,2]	FOUNDATIONS IN ABNORMAL PSYCHOLOGY	3
Social & Cultural Foundations		
EDC 635[1]	COUPLES AND FAMILY COUNSELING	3
EDC 673	COUNSELING MULTICULTURAL POPULATIONS	3
Foundations of Professional Responsibilities, Ethical, and Legal		
EDC 544	PHILOSOPHICAL, PROFESSIONAL, ETHICAL & LEGAL ASPECTS IN COUNSELING	2

Appraisal of the Individual		
EDC 535	TEST INTERPRETATIONS AND CASE STUDIES	2
EDC 631[3]	DIAGNOSIS OF EMOTIONAL AND MENTAL DISORDERS	3
Lifestyle and Career Development		
EDC 529	PSYCHOLOGY OF LIFESTYLES AND CAREER DECISION MAKING	2
Counseling Theory and Techniques		
EDC 543	THEORIES AND TECHNIQUES OF COUNSELING	3
EDC 545[2,4]	COUNSELING TECHNIQUES LAB	2
Group Dynamics		
EDC 583[4]	THEORIES AND TECHNIQUES OF GROUP COUNSELING	3
Research & Evaluation		
EDC 568	RESEARCH AND EVALUATION IN HUMAN SERVICES	3
EDT 660[5]	INTRODUCTION TO EDUCATIONAL RESEARCH	3
Supervised Practicum		
EDC 584[6]	PRACTICUM IN COUNSELING	2
Internship		
EDC 598[7,8]	INTERNSHIP IN COMMUNITY COUNSELING	2
Scholarly Project		
EDC 700	SCHOLARLY PROJECT	3
Option A - Research Project "Scholarship with Inquiry" (Prereq: EDT 660 & EDT 661)		
Option B - Project of Excellence "Scholarship with Counseling Competence" (Prereq: EDC 568 or EDT 660)		
Option C - Transformative Project "Scholarship with Social Action Application" (Prereq: EDC 568 or EDT 660)		
Comprehensive Seminar		
EDC 600	CULMINATING SEMINAR	1
Electives		4
EDC 523	DELINQUENTS AND JUVENILE COURT	1
EDC 574	INDEPENDENT STUDIES IN COUNSELING	1 - 3
EDC 605	PROFESSIONAL SEMINARS	1 - 3
Clinical Coursework for Professional Counseling Licensure[9]		**12**
Clinical Psychopathology, Personality and Abnormal Behavior		
EDC 623[10]	FOUNDATIONS IN ABNORMAL PSYCHOLOGY	3
Evaluation of Mental and Status		
EDC 630[11]	EVALUATION OF EMOTIONAL AND MENTAL CONDITION	3
Diagnosis of Mental and Emotional Disorders		
EDC 631[10]	DIAGNOSIS OF EMOTIONAL AND MENTAL DISORDERS	3
Methods of Intervention and Prevention of Mental and Emotional Disorders		
EDC 635[10]	COUPLES AND FAMILY COUNSELING	3
EDC 681	INTEGRATIVE APPROACH TO CLINICAL COUNSELING	3
Treatment of Mental and Emotional Disorders		
EDC 683[12]	TREATMENT OF MENTAL AND EMOTIONAL DISORDERS	3
EDC 686[12]	ADDICTIONS COUNSELING	3

At the beginning of the first term of enrollment in the program, students will be oriented to the program requirements and will develop a planned program of study as part of the EDC 500 Orientation to Community Counseling

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[1]Clinical counseling courses taken are part of the master's degree in community counseling

[2]Prerequisite: EDC 531

[3]Prerequisite: EDC 623

[4]Prerequisite: EDC 543

[5]EDT 660 is required for students pursuing the Research Project option of the Scholarly Project. Students taking Research Project must also take EDT 661 which will fulfill two semester hours of electives

[6]Prerequisite: EDC 545 & EDC 583

[7]Prerequisite: EDC 584

[8]Must be taken three times; 600 total clock hours.

[9]To fulfill the education requirements for the Professional Counseling (PC) license in addition to completing the master's degree requirements for the Community Counseling program students must also complete a 12 semester hour post-master's program in Clinical Counseling.

[10]Taken during Community Counseling program.

[11]Prerequisite: EDC 631

[12]Prerequisite: EDC 630

Master of Science in Higher Education Administration (EDC)

The master's program in higher education administration consists of eleven courses that integrate theory and research with practice. The program is designed to prepare students for a variety of academic and non-academic positions in post-secondary settings, industry, and government. The recently revised curriculum includes historical perspectives, law, finance, student issues, and organization and governance. Students complete a practicum and a culminating scholarly project. This program accommodates students holding full-time jobs.

		Sem. Hrs.
Higher Education Administration		**34**
Foundational Studies		
EDC 554	INTRODUCTION TO HIGHER EDUCATION AND STUDENT AFFAIRS	3
EDT 672	HISTORY OF HIGHER EDUCATION IN THE UNITED STATES	3
Professional Studies		
EDC 550	STUDENT DEVELOPMENT THEORY	3
EDC 557	STUDENT CULTURES IN THE UNIVERSITY ENVIRONMENT	3
EDC 560	LEADERSHIP IN COLLEGE AND UNIVERSITY ENVIRONMENT	3
EDC 568	RESEARCH AND EVALUATION IN HUMAN SERVICES	3
Advanced Studies		
EDC 556[1]	ADMINISTRATION AND ORGANIZATION IN HIGHER EDUCATION	3
EDC 561[1]	FINANCE IN HIGHER EDUCATION	3
EDC 563[1]	LAW AND ETHICS IN HIGHER EDUCATION	3
Supervised Practice[2]		
EDC 564	PRACTICUM IN HIGHER EDUCATION	3
Electives		
EDC 574	INDEPENDENT STUDIES IN COUNSELING	1 - 3
EDC 602	COUNSELING SEMINARS	1 - 2
Culmination[3]		
EDC 569	SCHOLARLY PROJECT	3

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[1]Prerequisite: EDC 554

[2]For those students in full-time positions in higher education. All others will complete 6 hours of internship.

[3]Prerequisite: Final Term Standing

Master of Science in Human Development Services (EDC)

This master's degree program is designed for persons who do not hold a teaching license and who do not wish to pursue licensure as a counselor, but who are interested in enhancing their human service skills for employment in other settings. The program is appropriate for persons in the clergy, nursing, criminal justice and other related fields.

Note: This degree does not lead to obtaining Ohio's Professional Counseling license or Professional Clinical Counseling license. Students who intend to obtain either of these credentials must enroll in the 48-hour community counseling master's degree program and also complete the additional 12 hours in clinical coursework for professional counseling licensure.

		Sem. Hrs.
Human Development Services		**30**
Foundational Courses		
EDC 531	PERSONALITY AND HUMAN DEVELOPMENT ACROSS THE LIFESPAN	2
EDC 568	RESEARCH AND EVALUATION IN HUMAN SERVICES	3
EDC 673	COUNSELING MULTICULTURAL POPULATIONS	3
Human Development Services Core		
EDC 525	INDEPENDENT RESEARCH	2
EDC 529	PSYCHOLOGY OF LIFESTYLES AND CAREER DECISION MAKING	2
EDC 543	THEORIES AND TECHNIQUES OF COUNSELING	3
EDC 545	COUNSELING TECHNIQUES LAB	2
EDC 583	THEORIES AND TECHNIQUES OF GROUP COUNSELING	3
EDC 602	COUNSELING SEMINARS	1 - 2
EDC 605	PROFESSIONAL SEMINARS	1 - 3
EDC 635	COUPLES AND FAMILY COUNSELING	3
Electives		5
EDC 523	DELINQUENTS AND JUVENILE COURT	1
EDC 574	INDEPENDENT STUDIES IN COUNSELING	1 - 3
EDC 602	COUNSELING SEMINARS	1 - 2
EDC 605	PROFESSIONAL SEMINARS	1 - 3

Master of Science in School Counseling (EDC)

The school counseling degree provides preparation for individuals who desire to be school counselors. Prerequisites for school counselor licensure include either: (1) a master's degree in counseling and two years of successful teaching experience under a standard teacher certificate or provisional or professional teacher license, and successful completion of internship consisting of six hundred contact hours in a school setting, OR (2) a master's degree in counseling, successful completion of an internship consisting of six hundred contact hours in a school setting, and a one-year induction under the supervision of a licensed school counselor. Upon completion of the master's degree, the Ohio Department of Education requires the PRAXIS specialty examination in school counseling. The degree program consists of 30 semester hours of coursework aligned with the CACREP eight common core areas and 18 semester hours our coursework in school counseling.

General Requirements

1. 48 semester hours
2. 600 clock hour internship
3. Scholarly project

		Sem. Hrs.
School Counseling		**48**
Professional Orientation and Ethical Practice		

EDC 501	ORIENTATION TO SCHOOL COUNSELING	1
EDC 522	INTRODUCTION TO GUIDANCE AND COUNSELING	3
EDC 544	PHILOSOPHICAL, PROFESSIONAL, ETHICAL & LEGAL ASPECTS IN COUNSELING	2
Social & Cultural Diversity		
EDC 673	COUNSELING MULTICULTURAL POPULATIONS	3
Human Growth and Development		
EDC 531	PERSONALITY AND HUMAN DEVELOPMENT ACROSS THE LIFESPAN	2
Career Development		
EDC 529	PSYCHOLOGY OF LIFESTYLES AND CAREER DECISION MAKING	2
EDC 529L	CAREER-DECISION MAKING LAB	1
Helping Relationships		
EDC 543	THEORIES AND TECHNIQUES OF COUNSELING	3
EDC 545	COUNSELING TECHNIQUES LAB	2
Group Work		
EDC 583	THEORIES AND TECHNIQUES OF GROUP COUNSELING	3
Assessment		
EDC 535	TEST INTERPRETATIONS AND CASE STUDIES	2
Research and Program Evaluation		
EDC 568	RESEARCH AND EVALUATION IN HUMAN SERVICES	3
EDC 700[3]	SCHOLARLY PROJECT	3
Option A - Research Project "Scholarship with inquiry" (Prereq EDT 660 & EDT 661)		
Option B - Project of Excellence "Scholarship with Counseling Competence" (Prereq: EDC 568 or EDT 660)		
Option C - Transformative Project "Scholarship with Social Action Application" (Prereq: EDC 568 or EDT 660)		
School Counseling		
EDC 532[1]	PSYCHOLOGY OF LEARNING DISABILITIES & OTHER EXCEPTIONALITIES	3
EDC 546	PROGRAM DEVELOPMENT AND IMPLEMENTATION IN SCHOOL COUNSELING	3
EDC 547	CONSULTATION & LEADERSHIP IN SCHOOL COUSELING	3
Clinical Experience		
EDC 585	PRACTICUM IN SCHOOL COUNSELING	2
EDC 599[2]	INTERNSHIP IN SCHOOL COUNSELING	2
Comprehensive Seminar		
EDC 600	CULMINATING SEMINAR	1

At the beginning of the first term of enrollment in the program, students will be oriented to the program requirements and will develop a planned program of study as part of the EDC 501 Orientation to School Counseling

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[1]Students certified in L.D. will take another counseling course.

[2]Must be taken three times; 600 total clock hours.

[3]Taken during internship.

Master of Science in School Psychology (EDC)

The purpose of the NASP-approved school psychology program is to train school psychologists to assist educators and parents in problem-solving efforts to meet the educational and mental health needs of children and youth in Ohio schools. The program prepares school psychology practitioners to use intervention-based consultation and assessment approaches in the specialist-level training.

Program and licensure standards require completion of both the master's degree and specialist-level training.

General Requirements

School Psychology program (37 semester hours)

1. Successful completion of specified 37 semester hours
2. Successful completion of practica
3. Successful completion of comprehensive examination

Ohio Licensure and Completion of Specialist-Level Training (42 semester hours; 79 semester hours with completion of school psychology program)

1. Successful completion of specified 42 semester hours.
2. Successful completion of internship
3. Successful completion of thesis
4. Development, presentation and approval of professional portfolio

Experience in Schools

A number of educational agencies in the Dayton area hire special education tutors, teacher aides, and substitute teachers, at hourly, daily, or yearly rates. Such employment offers financial support for living expenses and tuition payments, as well as excellent experience in preparation for the role of school psychologist. These experiences are highly recommended complements to the academic training component

Additional Courses Required for Applicants without Teaching License

Applicants who are not licensed teachers must take two courses, EDC 539, "Administration & Organization of Pupil Personnel Services," and EDC 573, "Orientation to the School Process," in addition to the required courses.

Transfer Credits

Upon acceptance into the school psychology program, transcripts of past courses will be reviewed to determine the possible need to add or substitute courses. Such a review must result in a course plan totaling at least 79 semester hours, covering the program content areas. Students may transfer up to six semester hours of graduate credit taken in other programs, if such coursework has been completed within five years prior to acceptance into the school psychology program and the grade is "B" or better. An additional 6 credits may be transferred toward completion of the Ed.S. degree.

Residency

All students in the school psychology program must meet a residency requirement by enrolling in course-work on a full-time basis (nine or more credits) for at least two consecutive terms (e.g., fall and winter, or winter and summer).

Competency Test

To obtain the Ohio license in school psychology, students must take the PRAXIS II specialty area test #40 (school psychologist), administered six times each year by ETS, and achieve Ohio's passing score of 630. To obtain the National Certification for School Psychologists a score of 660 on the PRAXIS II must be earned

Internship

Students seeking Ohio school psychology licensure who wish to intern in Ohio will be required to sign a statement of intent to work in Ohio as a school psychologist for at least one year following internship. The State of Ohio limits the number of internships each year to approximately 100. Of this number, the University of Dayton receives at least seven internship slots per year. For students not intending to work in Ohio following internship, internship arrangements may be made in another state.

Financial Aid

A few graduate assistantships are awarded each year to full-time students. (Full time status requires registration for a minimum of six credits per term.) Graduate assistantships require 20 hours work per week and include tuition costs for 15 semester credits per academic year, and provide a stipend. Guaranteed student loans are available to students who register for at least three credit hours per term, if the student's financial ability meets the eligibility criteria. A financial aid

information package may be obtained from the University's Financial Aid Office (937-229-4311). The granting of financial aid requires that the student first be admitted into a graduate program. A number of educational agencies in the Dayton area hire special education teacher aides, substitute teachers, and temporary teachers, at hourly, daily, or yearly rates. Such employment offers financial support for living expenses and tuition payments, as well as excellent experience in preparation for the role of school psychologist.

Accreditation

This program is approved by the National Association of School Psychologists (NASP) and by the Ohio Department of Education. In accordance with NASP standards, this program requires the equivalent of at least three years of full-time graduate study, including at least 60 graduate credit hours (specialist level), a residency of at least two consecutive full-time terms, and one academic year of supervised internship. The school psychology program is housed in the Department of Counselor Education and Human Services within the School of Education and Allied Professions and is approved by the National Council for Accreditation of Teacher Education (NCATE). The University of Dayton is accredited by the North Central Association (NCA).

Investigation of Criminal Record

School psychology students should be aware that the State of Ohio requires a fingerprint check to determine the existence of a criminal record. Such checks will be conducted by the Ohio Bureau of Criminal Investigation (BCI) and the FBI (for persons who have not been Ohio residents for the past five years), during the summer prior to the internship year, in order to be granted the one-year temporary child study license required for internship.

Teacher as Child/Youth Development Specialist Program (EDC)

This program is designed to qualify elementary and secondary school teachers for the professional teaching license issued by the Ohio State Department of Education. Teachers are urged to seek approval from their professional development committee as they pursue their graduate studies.

Note: This degree does not lead to obtainment of Ohio's School Counseling license. Students who intend on obtaining this licensure must enroll in the 48 semester hour school counseling master's degree program.

			Sem. Hrs.
Teacher as Child/Youth Development Specialist Program			**30**
Foundation Courses			
	EDC 522	INTRODUCTION TO GUIDANCE AND COUNSELING	3
	EDC 531	PERSONALITY AND HUMAN DEVELOPMENT ACROSS THE LIFESPAN	2
	EDC 535	TEST INTERPRETATIONS AND CASE STUDIES	2
	EDC 568	RESEARCH AND EVALUATION IN HUMAN SERVICES	3
	EDC 673	COUNSELING MULTICULTURAL POPULATIONS	3
- - -	EDC 544 or EDT 502 or EDT 503	PHILOSOPHICAL, PROFESSIONAL, ETHICAL & LEGAL ASPECTS IN COUNSELING (EDC 544) PHILOSOPHICAL STUDIES IN EDUCATION (EDT 502) HISTORY OF EDUCATION IN THE UNITED STATES (EDT 503)	2 - 3
Child/Youth Development Specialist Core			
	EDC 529	PSYCHOLOGY OF LIFESTYLES AND CAREER DECISION MAKING	2
	EDC 532[1]	PSYCHOLOGY OF LEARNING DISABILITIES & OTHER EXCEPTIONALITIES	3
	EDC 543	THEORIES AND TECHNIQUES OF COUNSELING	3
	EDC 545	COUNSELING TECHNIQUES LAB	2
	EDC 583	THEORIES AND TECHNIQUES OF GROUP COUNSELING	3

Electives

EDC 523	DELINQUENTS AND JUVENILE COURT	1
EDC 574	INDEPENDENT STUDIES IN COUNSELING	1 - 3
EDC 602	COUNSELING SEMINARS	1 - 2
EDC 605	PROFESSIONAL SEMINARS	1 - 3

[1]Students certified in L.D. will take another counseling course.

Courses **(Collapse All Courses)**

Code Title Sem. Hrs.

EDC 500 ORIENTATION TO COMMUNITY COUNSELING 1

This course will introduce students to the expectations and requirements of the community counseling program and give them an introduction to the profession of counseling. A holistic approach to counseling will be used.

EDC 501 ORIENTATION TO SCHOOL COUNSELING 1

This course will introduce master's degree students to the University of Dayton's school counseling program including program study requirements and expectations. Issues related to professional identity development will also be addressed.

EDC 510 CONSULTATION IN THE SCHOOLS 3

The role of the school psychologist as a consultant in a school setting is examined with emphasis on acquiring effective consultation skills. A school-based, problem-solving model is presented that requires development of appropriate consultant skills. (Practicum is EDC 511).

EDC 511 SCHOOL PSYCHOLOGY PRACTICUM: CONSULTATION 1

Practicum for EDC 510.

EDC 512 COGNITIVE ASSESSMENT FOR INTERVENTION 3

Development of proficiency in administration, scoring, and interpreting intelligence tests to be used in conjunction with other assessment information for completing multifactored evaluations and developing interventions for assisting children and youth, birth through age 21. (Practicum is EDC 513).

EDC 513 SCHOOL PSYCHOLOGY PRACTICUM: COGNITIVE AFI 1

Practicum for EDC 512.

EDC 514 ACADEMIC ASSESSMENT FOR INTERVENTION 3

This course provides students with the knowledge and skills necessary for the effective evaluation of the academic strengths and needs of children and youth. The school psychology student will be exposed to the requirements for completing non-discriminatory, multi-factored assessments and intervention-based assessment. The emphasis is on the completion of a case study within the context of the Response to Intervention model of practice. (Practicum is EDC 515).

EDC 515 SCHOOL PSYCHOLOGY PRACTICUM: ACADEMIC AFI 1

Practicum for EDC 514.

EDC 516 ACADEMIC AND BEHAVIORAL ASSESSMENT INSTRUMENTS 3

School psychology graduate students learn to administer, score and interpret academic and behavioral instruments. The instruments are limited to those that can be used with pre-school to 12th grade children and adolescents. (Practicum is EDC 517).

EDC 517 SCHOOL PSYCHOLOGY PRACTICUM: SHADOWING 1

Practicum for EDC 572

EDC 522 INTRODUCTION TO GUIDANCE AND COUNSELING 3

This course is designed to assist graduate students in building skills and developing an understanding relative to the guidance and counseling role of human service practitioners. Essentially, this role consists of assisting children, youth, and adults from diverse backgrounds in reaching their maximum academic and personal development within various educational and community settings.

EDC 523 DELINQUENTS AND JUVENILE COURT 1

This course examines (1) the juvenile court system, (2) underlying ideologies and current debates concerning treatment and/or punishment decisions, and (3) children and families at risk of juvenile court involvement.

EDC 524 EDUCATIONAL AND OCCUPATIONAL INFORMATION 2

Selection, utilization, and evaluation of educational and occupational information materials; familiarization with standard labor market data, current requirements for admission into college, and available sources of placement information.

EDC 525 INDEPENDENT RESEARCH 2

COMMUNITY RESOURCES: Designed to enable the graduate student to acquire the skills and knowledge needed to develop, organize, and utilize a working resource file of local and national organizations and agencies (medical, pastoral, social welfare, mental, educational, industrial, labor, commercial, governmental, and recreational).

EDC 528 CAREER EDUCATION 2

Assistance for teachers, counselors, administrators, and social agency personnel in improving their career education functions through a coordinated and concentrated effort of occupational guidance integrated within the total curriculum.

EDC 529 PSYCHOLOGY OF LIFESTYLES AND CAREER DECISION MAKING 2

Focuses on theories, strategies, information, assessment, and resources to be used in the career counseling of children, youth, and adults.

EDC 529L CAREER-DECISION MAKING LAB 1

Course content focuses on theories, strategies, information, assessments, and resources to be used in the career counseling of children and youth in the k-12 setting.

EDC 531 PERSONALITY AND HUMAN DEVELOPMENT ACROSS THE LIFESPAN 2

Individual growth and development across the lifespan with emphasis on the dynamic of personal behavior. This course emphasizes the integrating theme that cognitive structure is an important director of human behavior, and that the understanding of personality requires that we understand the role of cognitive structure personality. While this cognitive perspective is emphasized, the course covers a wide range of concerns to the student of personality across the lifespan. It discusses a representative selection of personality theories, personality structure, development, dynamics, maladaptive behavior, and personality change.

EDC 532 PSYCHOLOGY OF LEARNING DISABILITIES & OTHER EXCEPTIONALITIES 3

Designed to provide an overview of the range of handicapping conditions for which educational program standards have been developed. Emphasis is given to the cognitive and affective impact upon the individual and family.

EDC 535 TEST INTERPRETATIONS AND CASE STUDIES 2

Understanding of the individual through the appraisal techniques of individual and group testing and case study. Tests include a wide range of educational and psychological instruments. Individual differences influenced by elements such as ethnic, cultural, and gender factors are considered.

EDC 537 STATISTICS 3

This course provides an introduction to descriptive and inferential statistics and to SPSS. Much of the course learning activities are computer and Web based.

EDC 538 CHILD & ADOLESCENT PSYCHOPATHOLOGY 3

This course provides an overview of the normal and abnormal development of child and adolescent personality. The use of the DSM-IV is emphasized, and distinctions between disorders and special education disabilities are made. Each of the several aspects of child and adolescent psychopathologies are examined and prevention approaches are introduced.

EDC 539 ADMINISTRATION & ORGANIZATION OF PUPIL PERSONNEL SERVICES 2

This course provides students the opportunity to gain field-based experiences in schools. It is required for school psychology students who do not have a teacher license.

EDC 541 CURRICULUM AND INSTRUCTION FOR DIVERSE LEARNERS 3

This course provides students with the foundation knowledge necessary for understanding the diverse learning needs of children and adolescents. Topics include types of handicapping conditions, gifted and talented, instructional settings, curriculum and instructional methods, and classroom management techniques.

EDC 543 THEORIES AND TECHNIQUES OF COUNSELING 3

Through analysis of varied theoretical models, skills in counseling will be developed in an integrated approach for modifying the behavior or children, youth, and adults through individual and system change.

EDC 544 PHILOSOPHICAL, PROFESSIONAL, ETHICAL & LEGAL ASPECTS IN COUNSELING 2

Study of philosophical assumptions of the various theories of counseling and psychotherapy. Treatment of counseling ethics and professional practices; laws and court decisions pertaining to counseling.

EDC 545 COUNSELING TECHNIQUES LAB 2

Supervised experience in counseling. Both group and individualized instruction and supervision.
Prerequisite(s): EDC 531, 543.

EDC 546 PROGRAM DEVELOPMENT AND IMPLEMENTATION IN SCHOOL COUNSELING 3

Course content focuses on the development, implementation and evaluation of comprehensive developmental school counseling programs, including the knowledge, skills and practices necessary for engaging in an ongoing process of needs assessment, program development and implementation and program evaluation geared toward promoting the academic achievement, career planning and personal/social development of all PreK-12 students.

EDC 547 CONSULTATION & LEADERSHIP IN SCHOOL COUSELING 3

Course content focuses on preparing school counseling candidates to becme effective educational leaders, advocates and collaborators through exposure to current educational leadership and advocacy models and through active involvement in relevant skill building exercises. School counseling candidates will learn to lead and consult effectively with diverse students, parents, teachers, administrators, and various other educational stakeholders.

EDC 550 STUDENT DEVELOPMENT THEORY 3

The study of basic theoretical perspectives underlying college student development and assessment of development to the practice of college student personnel.

EDC 551 APPLICATION OF STUDENT DEVELOPMENT THEORY 2

In-depth study and critique of selected student and adult development theories, assessment of students' development on those theories, and application to the practice of College Student Personnel.

EDC 553 INTERNSHIP IN COLLEGE STUDENT PERSONNEL 2

Participate as a professional to gain significant practical experience in a student affairs office under the supervision of a practicing professional. The student is required to take a total of six semester hours over three semesters. Each internship experience must be at a different site.

EDC 554 INTRODUCTION TO HIGHER EDUCATION AND STUDENT AFFAIRS 3

Comprehensive overview of all academic and non-academic facets of colleges and universities as listed in the Carnegie Classification, in terms of mission, personnel, positions, and procedures.

EDC 555 ADMINISTRATION AND ORGANIZATION OF COLLEGE STUDENT PERSONNEL PROGRAMS 3

This course deals with issues related to the administration of student personnel programs in colleges and universities and examines the organizational structures associated with the delivery of these programs in the context of current higher education administrative environments.
Prerequisite(s): EDC 554.

EDC 556 ADMINISTRATION AND ORGANIZATION IN HIGHER EDUCATION 3

This course deals with the administration of broad areas of colleges and universities by examining the organizational structure and culture associated with the delivery of programs and services.
Prerequisite(s): EDC 554.

EDC 557 STUDENT CULTURES IN THE UNIVERSITY ENVIRONMENT 3

In-depth study of college student cultures and their impact on the individual college student experience. Particular attention will be paid to understanding the student culture in student personnel work.

EDC 560 LEADERSHIP IN COLLEGE AND UNIVERSITY ENVIRONMENT 3

Study of the concepts, literature, and research in leadership and their relationship to the development and maintenance of the organization. Higher education and college student personnel examples will be emphasized.

EDC 561 FINANCE IN HIGHER EDUCATION 3

Study and analysis of the planning, methodologies, financial strategies, and evaluative systems for university systems and subsystems.

EDC 562 INTERVENTIONS IN COLLEGE STUDENT PERSONNEL 3

Theories and practice of group interventions in student personnel settings; conceptualization and assessment of interventions appropriate to human and organizational student personnel settings. Course includes development of intervention skills.

EDC 563 LAW AND ETHICS IN HIGHER EDUCATION 3

Through study and reflection in the fields of law and ethics, students are asked to consider the kinds of administrative actions that lead people and institutions into court and to develop alternative approaches and attitudes.

EDC 564 PRACTICUM IN HIGHER EDUCATION 3

Supervised experience in higher education administration with faculty and on-site supervisor. Topics and requirements will vary with experience and placement area. Designed for students working in full-time positions in higher education settings.

EDC 568 RESEARCH AND EVALUATION IN HUMAN SERVICES 3

This course provides professionals in the public schools, higher education institutions, and community agencies with the basic quantitative and qualitative tools of inquiry and when to use them to answer research questions. Emphasis also includes critiquing research studies and applying research results to practice. College Student Personnel and Higher Education Administration students must have 21 Hours.

EDC 569 SCHOLARLY PROJECT 3

A culminating course in which students in their final term integrate, synthesize, and apply the academic work and professional experiences gathered during their program. Students will complete a project designed with the assistance of faculty and campus administrators and present it along with their peers in a supportive learning community. Taken toward the end of the program.
Prerequisite(s): EDC 568.

EDC 571 BIOLOGICAL BASES OF BEHAVIOR 3

Survey of three biological bases of behavior, including neuropsychology, genetics, and psycho-pharmacology.

EDC 572 ROLE AND FUNCTION OF THE SCHOOL PSYCHOLOGIST 2

Topics of significance in the profession of school psychology, with emphasis on history and foundations of school psychology, legal and ethical issues, professional issues and standards, roles and functions of the school psychologist. Students are expected to develop knowledge and skills in using APA format in the context of a literature review.

EDC 573 ORIENTATION TO THE SCHOOL PROCESS 1

Directed observation of and participation in the normal school process under supervision within the school. Required of all school psychology candidates who do not have a teaching certificate.

EDC 574 INDEPENDENT STUDIES IN COUNSELING 1 - 3

Independent study.
Prerequisite(s): Permission of department chairperson.

EDC 575 COUNSELING MULTICULTURAL POPULATIONS 3

Designed to develop sensitivity and awareness in human diversity; introduce multicultural concepts, competencies, and research; and provide an experiential component.

EDC 580 GUIDANCE IN THE ELEMENTARY SCHOOL 2

A course for teachers and counselors to discuss concepts and techniques of guidance within the framework of the elementary school. The emphasis is on today's child; child problem situations; theories for understanding child behavior; basic guidance services; roles and responsibilities of personnel; cross-cultural counseling; consulting with parents, teachers, and administrators; record analysis, observation; pupil-participating assessment techniques; and information dissemination and career education.

EDC 581 TECHNIQUES OF CHILD COUNSELING 2

This course focuses on practical counseling, consulting, and intervention techniques for the specific developmental, social, or behavior problems children experience. The course will provide suggestions for counseling all children, including the exceptional and those who are experiencing special concerns resulting from societal problems.

EDC 583 THEORIES AND TECHNIQUES OF GROUP COUNSELING 3

Course content focuses on the stages, theories, strategies, and applications of the group counseling process.

EDC 584 PRACTICUM IN COUNSELING 2

Supervised practice and observation in group and individual counseling techniques.
Prerequisite(s): EDC 545, 583.

EDC 585 PRACTICUM IN SCHOOL COUNSELING 2

Supervised practice and observation in group and individual counseling techniques.
Prerequisite(s): Completion of content courses.

EDC 598 INTERNSHIP IN COMMUNITY COUNSELING 2

Directed experience in professional functions within cooperating social and clinical agencies in the community. Must be taken three times.
Prerequisite(s): EDC 584; permission of department chairperson.

EDC 599 INTERNSHIP IN SCHOOL COUNSELING 2

Extensive directed experience in professional functions within cooperating schools and community organizations. Must be taken three times.
Prerequisite(s): EDC 584.

EDC 600 CULMINATING SEMINAR 1

This course prepares students to take a comprehensive examination covering the course content of their masters degree program. In addition for students who will seek certification as school counselors or licensure as professional counselors or professional clinical counselors, the course serves as a preparation for the competency exams related to these credentials.

EDC 602 COUNSELING SEMINARS 1 - 2

A series of specific courses designed to present topics of unique interest to students in a variety of professional areas. Areas often include state-of-the-art assessment and intervention methods presented by community experts.

EDC 605 PROFESSIONAL SEMINARS 1 - 3

Learner-oriented courses in which a group of students focus on a specific topic related to the professional, ethical, or practical applied aspects of clinical counseling as implemented in a clinical setting.

EDC 610 SOCIAL BEHAVIORAL ASSESSMENT FOR INTERVENTION 3

This course and its practicum (EDC 611) provide instruction and practice in the data-based, problem-solving, intervention-based assessment of the social and behavioral functioning of preschool children and of school-age children and adolescents. Course content includes various models and methods of assessment, sources of assessment data, and intervention planning.

EDC 611 SCHOOL PSYCHOLOGY PRACTICUM: SOCIAL/BEHAVIORAL AFI 1

Practicum for EDC 610.

EDC 612 ASSESSMENT FOR INTERVENTION AND ACCOUNTABILITY 3

The focus of this course is accountability in the schools with emphases on legal bases, standards of practice, individual and group accountability, and program evaluation. Students complete program evaluation project in this course. (Practicum is EDC 613).

EDC 613 SCHOOL PSYCHOLOGY PRACTICUM: ACCOUNTABILITY AFI 1

Practicum for EDC 612.

EDC 615 CULMINATING SEMINAR 3

This course employs a seminar format to discuss current issues in the practice of school psychology.

EDC 623 FOUNDATIONS IN ABNORMAL PSYCHOLOGY 3

Description of the specific aspects of personality theory and cultural and biological factors that lead to an understanding of abnormal behavior and psychopathology as it affects a wide range of individuals from children through the aged. The relevance of these concepts and theories to clinical counseling is explored. This course incorporates theory (quantitative) and group exercises (qualitative and performative knowledge).
Prerequisite(s): EDC 531.

EDC 630 EVALUATION OF EMOTIONAL AND MENTAL CONDITION 3

Includes the use of assessment procedures in diagnosis, treatment planning, and outcome measurement. Methods of administering and interpreting individual and group standardized tests of mental ability interest and personality are emphasized.
Prerequisite(s): Master's degree in community counseling.

EDC 631 DIAGNOSIS OF EMOTIONAL AND MENTAL DISORDERS 3

Presentation of the mental status exam and other means of developing a diagnosis as described in the current edition of the "Diagnostic and Statistical Manual for Mental Disorders." Special problems including mental retardation, psychosexual disorders, substance abuse, and addiction are also considered. This course incorporates theory (quantitative knowledge) and case studies (qualitative and performative knowledge). The use of the diagnosis in developing treatment plans will be emphasized.
Prerequisite(s): EDC 623.

EDC 635 COUPLES AND FAMILY COUNSELING 3

This course is designed to introduce students to systems theory, the dynamics of human relationships, theories and techniques of marital and family counseling, and professional and legal issues in marital and family counseling. Students will acquire skills and understanding relative to the role of the counselor in assisting families to develop new strategies, solve problems, and facilitate individual and family growth.

EDC 655 CAREER GUIDANCE INSTITUTE 2

Designed to assist counselors, teachers, and administrators implement an effective career guidance program and promote a positive working relationship between education and business and industry leaders.

EDC 673 COUNSELING MULTICULTURAL POPULATIONS 3

Designed to develop sensitivity and awareness in human diversity; introduce multicultural concepts, competencies, and research; and provide an experiential component.

EDC 681 INTEGRATIVE APPROACH TO CLINICAL COUNSELING 3

Assistance for the students in selecting that theory or those aspects of various theories of clinical counseling that best characterize their approach to clients. Emphasis is on the integration of theories with the counselor's personal characteristics and experience. This includes emphasis on self reflection (qualitative knowledge), theory (quantitative knowledge), and counseling exercises (performative knowledge).
Prerequisite(s): Master's degree in community counseling.

EDC 683 TREATMENT OF MENTAL AND EMOTIONAL DISORDERS 3

Presentation of methods used in treatment and management of mental disorders including treatment planning, counseling techniques, record keeping, referral procedures, and use of psychotropic medication.
Prerequisite(s): Master's degree in community counseling.

EDC 686 ADDICTIONS COUNSELING 3

Course content focuses on theories, strategies, information, assessments, and resources to be used in addictions counseling of persons over the lifespan.
Prerequisite(s): EDC 630

EDC 690 INTERNSHIP IN CLINICAL COUNSELING 4

Supervised experience in a field placement setting that specializes in the evaluation and treatment of persons with emotional and mental disorders. Incorporates on-site experience with a self-reflection model and case presentations in a senior format (qualitative and quantitative knowledge).
Prerequisite(s): Master's degree in community counseling.

EDC 700 SCHOLARLY PROJECT 3

To familiarize the student with the scientific literature of the counseling profession in a more focused way and utilize their research of the literature in one of three specific alternatives: (1) Thesis - literature search and inquiry; (2) Project of Excellence - literature search and counseling competence; (3) Transformative project - literature search and social action application.

EDC 710 INTERNSHIP IN SCHOOL PSYCHOLOGY 5

Semester I of a nine month, 1200-hour field experience under the direct supervision of certified school psychologists as well as the supervision of university faculty.

EDC 711 INTERNSHIP IN SCHOOL PSYCHOLOGY 5

Semester II of a nine month, 1200-hour field experience under the direct supervision of certified school psychologists as well as the supervision of university faculty.

EDC 712 INTERNSHIP IN SCHOOL PSYCHOLOGY 5

Semester III of a nine month, 1200-hour field experience under the direct supervision of certified school psychologists as well as the supervision of university faculty.

EDC 800 THESIS 2

This 2 semester course series provides support to students who are completing their school psychology thesis.

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AUGUST 2006 - GRADUATE ISSUE
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School of Education and Allied Professions

(EDA) Educational Leadership (Collapse Description)

Rev. Joseph Massucci, Chair of the Department

The primary mission of the Department of Educational Leadership is to prepare individuals to be educators and scholar-practitioners who will understand and be able to implement a leadership role. The department is committed to productive scholarship, effective teaching, disciplined inquiry, collaborative learning, and the acceptance, in an academic sense, of divergent views.

The Department of Educational Leadership is committed to providing quality instruction and support to individuals who (1) have demonstrated leadership potential within an educational setting and have expressed interest in pursuing a master's degree in educational leadership, or (2) hold a master's degree and wish to pursue a specific administrative licensure program, or (3) are interested in earning the Educational Specialist degree or the Ph.D., or (4) wish to improve their educational leadership knowledge and skills.

Advising

Upon acceptance into the program, the student will be assigned a faculty advisor who will be available to assist the student with information relative to their course of study. Students needing registration or program evaluation information should contact the department office.

Programs (Collapse All)

Program Name

Curriculum, Instruction, and Professional Development Licensure (CIPD) (EDA)

A total of 42 semester hours is required to obtain the curriculum, instruction, and professional development licensure. Students may earn this licensure by completing the educational leadership master's degree, or its equivalent, plus 12 additional semester hours of coursework as listed below. Students applying for an initial administrative license must pass, with a minimum score of 610, the "Educational Leadership: Administrative and Supervision" (10410) Praxis II test.

		Sem. Hrs.
CIPD		
Required		
EDA 607	INTERNSHIP II	3
EDA 611	ASSESSMENT & INSTRUCTION FOR SCHOOL IMPROVEMENT	3
Electives (choose 2 from the following 3 courses)		
EDA 710	CURRICULUM EVALUATION AND INSTRUCTION	3
EDA 711	CURRICULUM DEVELOPMENT AND LEADERSHIP	3
EDA 712	PROGRAM AND STAFF DEVELOPMENT	3

Educational Specialist in Educational Leadership (EDA)

Rev. Joseph Massucci, Program Director

The educational specialist degree is offered jointly by the Graduate Schools of the University of Dayton and Wright State University.

This post-master's educational specialist degree, Ed.S., program is designed to enhance individual capabilities for educational leadership for school administrators. The areas of staff/organizational development, curriculum development, program development and evaluation, law/finance/facilities, public relations, and research are included. Emphasis is given to preparing individuals for central office positions.

The planned program of study requires a minimum of 33 semester hours of designated graduate work beyond the master's degree. The program may be completed either at the University of Dayton or at Wright State University. Previous post-master's coursework may be transferred into the program if it supports the objectives of the overall program.

		Sem. Hrs.
Educational Specialist		**33**
EDA 611	ASSESSMENT & INSTRUCTION FOR SCHOOL IMPROVEMENT	3
EDA 807	EdS PROJECT SEMINAR	3
EDA 812	PROGRAM AND STAFF DEVELOPMENT	3
EDA 818	THE SUPERINTENDENCY	3
EDA 833	INTERNSHIP III	3
EDA 851	RESEARCH	3
EDA 855[1]	LEGAL ISSUES IN SCHOOL LEADERSHIP	3
EDU 808	IDEAS THAT SHAPE AMERICAN EDUCATION	3
Educational Specialist Electives (see below)		9

Electives (select three courses from the following)

EDA 810	CURRICULUM EVALUATION & INSTRUCTION	3
EDA 811	CURRICULUM DEVELOPMENT AND LEADERSHIP	3
EDA 816	BUSINESS AFFAIRS AND PHYSICAL RESOURCES	3
EDA 854	ISSUES IN SCHOOL FINANCE AND ECONOMICS	3
EDA 856	CONTRACT ISSUES IN SCHOOL LEADERSHIP	3
EDA 857	DECISION MAKING	3
EDA 858	THE POLITICS OF EDUCATIONAL LEADERSHIP	3
EDA 859	THE LAW OF SPECIAL EDUCATION	3

[1]EDA 859 may be substituted as a required course.

Master of Science in Educational Leadership (EDA)

To earn a master's degree in educational leadership, the student is required to successfully complete a minimum of 30 semester hours and achieve a grade point average of 3.0 or better from the courses listed below. Students have the opportunity to pursue coursework via the Internet or by combining distance learning and traditional courses in pursuit of the Master's Degree.

The Department of Educational Leadership offers an online master's degree with a Catholic school leadership concentration. Tuition scholarships are available to teachers and administrators working full time in Catholic schools or diocesan offices. For further program and scholarship information, contact Rev. Joseph Massucci, Chair at joseph.massucci@notes.udayton.edu. A three summer traditional program is also available for Catholic school educators.

		Sem. Hrs.
Educational Leadership		**30**
EDA 505[1]	EDUCATIONAL LEADERSHIP	3
EDA 507[2]	INTERNSHIP I	3

EDA 509	SUPERVISION & PROFESSIONAL DEVELOPMENT	3
EDA 510	INSTRUCTIONAL LEADERSHIP	3
EDA 511	CURRICULUM	3
EDA 515	SCHOOL LAW	3
EDA 551	RESEARCH	3
EDA 555	COMMUNITY RELATIONS FOR SCHOOL LEADERS	3
EDA 556	LEADERSHIP IN DIVERSE COMMUNITIES	3
EDA 557	SCHOOL FINANCE	3

[1]With permission of the chairperson, EDT 502 Philosophical Studies in Education or EDT 503 History of Education may substitute for preferred course EDA 505.
[2]Prerequisite: EDA 551.

Ph.D. in Educational Leadership (EDA)

A. William Place, Program Director

The Ph.D. program in educational leadership is designed for educators who are committed to providing leadership at elementary, secondary, and collegiate levels. The program seeks to prepare scholar-practitioners, leaders who:

1. value both speculative and practical knowledge and engage in continuous inquiry on professional concerns;
2. deliberate with colleagues upon organizational purposes and the means for achieving them;
3. work selflessly with others; and
4. commit themselves to improving the quality of life within society.

The Ph.D. Program in Educational Leadership offers a choice of two different concentration areas:

- P-12 School Administration - The concentration in school administration is designed to prepare educators for the following types of positions: administrative roles in elementary and secondary education, educational researchers, consultants, or professor of school administration. Students pursuing this concentration may opt to take additional courses to meet the requirements for a principal's license and a superintendent's license.

Concentration Coordinator - Dr. Theodore Kowalski

- Higher Education - This specialization consists of a six-course sequence probing the important literature, concepts and practices in higher education. Using reflective inquiry to generate right questions, moral inquiry to ground decisions, and action inquiry to guide praxis, this program models an on-going transformative process.

Concentration Coordinator - Dr. Darla Twale

Coursework

Formal coursework in the program is organized around the concepts of research, foundations, and organizational behavior. Coursework in an academic field outside of education is also encouraged. Minimum requirements are listed below:

Research - 12 semester hours
Dissertation - 9 semester hours
Foundations - 6 semester hours
Organizational Principles and Issues - 6 semester hours
Program Concentration - 21 semester hours
Cognate - 9 semester hours
Total - 63 semester hours

Residency

Residency is completed during the first three consecutive terms (fall, winter, summer) following admission to the program; a minimum of six semester hours of coursework must be completed in each of these terms.

Comprehensive Examination

In addition to completing course-work and residency requirements, students will successfully complete written examinations based on the content of their coursework and dissertation research topics.

Principal Licensure (EDA)

Students may earn a Principal license by completing the University of Dayton Master of Science degree in Educational Leadership, or its approved equivalent; successfully completing the 12 semester hours of designated Principal license coursework; providing evidence of three years of successful teaching experience under a standard teaching credential, of which at least 2 years must be on the level for which the administrative license is sought; and obtaining a passing score (minimum score of 610) on the "Educational Leadership: Administrative and Supervision (10410) Praxis II test.

Students have the opportunity to pursue coursework via the Internet or by combining distance learning* and traditional courses in pursuit of the Principal license.

*Distance learning students may substitute EDA 610 Curriculum Development or EDA 651 School Improvement in place of EDA 611 Assessment and Instruction for School Improvement during the 06/07 academic year.

		Sem. Hrs.
Principal		
EDA 607	INTERNSHIP II	3
EDA 611	ASSESSMENT & INSTRUCTION FOR SCHOOL IMPROVEMENT	3
EDA 626	STAFF PERSONNEL	3
EDA 655	PRINCIPALSHIP	3

Staff Personnel Administration Licensure (EDA)

A total of 54 semester hours is required to obtain staff personnel administration licensure. Students may earn this licensure by completing the educational leadership master's degree and the principal licensure program, or their equivalent, plus 12 additional semester hours of coursework as listed below.

Students have the opportunity to pursue coursework via the Internet or by combining distance learning1 and traditional courses in pursuit of the Principal license.

		Sem. Hrs.
Staff Personnel Administration		
EDA 712	PROGRAM AND STAFF DEVELOPMENT	3
EDA 755	LEGAL ISSUES IN SCHOOL LEADERSHIP	3
EDA 756	CONTRACT ISSUES IN SCHOOL LEADERSHIP	3
EDC 583	THEORIES AND TECHNIQUES OF GROUP COUNSELING	3

Superintendent Licensure (EDA)

Students may earn a Superintendent license by completing both the University of Dayton Master of Science degree in Educational Leadership and the Principal licensure, or their approved equivalent, plus the 15 additional semester hours of designated coursework as listed below. In addition, students must have successfully completed three years of administrative experience under a standard administration credential.

		Sem. Hrs.
Superintendent		
EDA 718	THE SUPERINTENDENCY	3
Select four elective courses from the following:[1]		
EDA 716	BUSINESS AFFAIRS AND PHYSICAL RESOURCES	3

EDA 754	ISSUES IN SCHOOL FINANCE AND ECONOMICS	3
EDA 755	LEGAL ISSUES IN SCHOOL LEADERSHIP	3
EDA 757	DECISION MAKING	3
EDA 758	THE POLITICS OF EDUCATIONAL LEADERSHIP	3
EDA 759	THE LAW OF SPECIAL EDUCATION	3

[1]EDA 756 Contract Issues may also apply as an elective course.

Courses **(Collapse All Courses)**

Code Title Sem. Hrs.

EDA 505 EDUCATIONAL LEADERSHIP 3

The focus of this course is leadership within schools and the role of the educational leader as scholar/practitioner emphasizing excellence in the educational organization through the effective integration of theory and practice.

EDA 507 INTERNSHIP I 3

This course provides opportunities for the student to experience administrative responsibilities. Emphasis is placed on practicing the skills learned in the master's program, receiving feedback on efforts, and relating practice to theory.
Prerequisite(s): EDA 551.

EDA 509 SUPERVISION & PROFESSIONAL DEVELOPMENT 3

This course in the theory and practice of supervision is designed to explore essential concepts and skills necessary in providing leadership in the area of formative and summative evaluation for the improvement of teaching and learning. Emphasis will be placed on concepts and means of the scholar-practitioner providing leadership in the supervisory task areas and building learning communities through critical reflection.

EDA 510 INSTRUCTIONAL LEADERSHIP 3

The course focus is on developing knowledge, skills, attitudes, and values essential in helping others to expand/refine their instructional effectiveness. Emphasis is placed on helping teachers use alternating models of instruction, diagnosing learner needs, prescribing appropriate learner instructional strategies, and accommodating learner needs based upon the concept of diversity.

EDA 511 CURRICULUM 3

The focus of this course is on the development of an understanding of the history, purposes, and practices of the school curriculum. Within the course, emphasis is placed on helping students personally integrate the scholarly and practical dimensions and on demonstrating that integration.

EDA 515 SCHOOL LAW 3

This course addresses legal issues pertinent to teacher, administrator, and student legal rights and responsibilities in the school building. The legal process, structures of the law, legislation/litigation, and practices to avoid legal infringements are addressed.

EDA 551 RESEARCH 3

This course will equip school leaders with the tools of research. Emphasis will be placed on becoming frequent and knowledgeable users of research on schools, developing skills in critiquing research, and applying the tools of research to address issues that face school leaders. This course is a prerequisite for EDA 507.

EDA 555 COMMUNITY RELATIONS FOR SCHOOL LEADERS 3

This course is designed to assist school administrators in refining their communication skills and political understanding. Provisions are made for the development of guidelines, techniques, and practices that facilitate wholesome relationships between school and community.

EDA 556 LEADERSHIP IN DIVERSE COMMUNITIES 3

This course will promote understanding of differences in race, gender, social class, religious affiliation, and sexual orientation and the implications of these differences for leadership in the school setting. Emphasis will be on promoting understanding and managing diversity within schools as learning organizations.

EDA 557 SCHOOL FINANCE 3

This course addresses topics such as equity, adequacy, efficiency in school funding; local, state, and federal funding sources; funding methods; and budgeting emphasizing features unique to Ohio.

EDA 607 INTERNSHIP II 3

The internship is intended to provide the participant an opportunity to relate the coursework, research, simulation, and independent study in which he/she has engaged to actual problems encountered in administering the elementary or secondary school building/program.

EDA 611 ASSESSMENT & INSTRUCTION FOR SCHOOL IMPROVEMENT 3

This course focuses on the role of educational leaders with setting and attaining high academic goals for the primary purpose of maximized student learning outcomes, thus improving the practices of instruction and assessment. Educational leaders need an understanding of the best practices for enhancing teaching, curriculum, supervision, assessment and professional development. Educational leaders also need to know how to collect, interpret and analyze what's been assessed and to use this data with reporting to various constituents of the learning community. The focus of this course is the integration of theory with the practices of instruction and assessment for improving the teaching/learning process.

EDA 626 STAFF PERSONNEL 3

This course emphasizes the systematic selection, evaluation, assignment and development of both professional and classified school personnel. Scholar-practitioners participating in this class will develop an understanding of the associated task areas.

EDA 655 PRINCIPALSHIP 3

This course centers on the application of leadership and management principles to the elementary, middle, and secondary school settings. Emphases include developing vision and mission statements, reflecting on the leadership role of the principal, and reviewing the process for the daily administration of the total school program.

EDA 710 CURRICULUM EVALUATION AND INSTRUCTION 3

This course is designed to refine participant understanding of the realms of meaning, characteristics of effective programs, research findings on effective instruction, and curriculum management.

EDA 711 CURRICULUM DEVELOPMENT AND LEADERSHIP 3

The major focus of the course will be how an educational leader at the district level designs and implements curriculum based upon philosophical, psychological, and historical underpinnings of curriculum theory. A recurring focus in the course is the relationship of practice and scholarship and practice and theory as the educational leader creates a learning community.

EDA 712 PROGRAM AND STAFF DEVELOPMENT 3

This course is designed to strengthen student competence with program development and evaluation processes. Major emphasis is focused on staff development planning, program implementation, and program assessment.

EDA 716 BUSINESS AFFAIRS AND PHYSICAL RESOURCES 3

The student examines the fiscal operation of school districts from a business affairs point of view, as well as the proper use of the school district's physical resources. Energy conservation, facilities for the handicapped, and construction of new facilities are discussed.

EDA 718 THE SUPERINTENDENCY 3

This course addresses the duties and responsibilities of central office administrators, especially those of the superintendent. Emphasis is placed on board of education relations, communication, and an analysis of the political structures within which the superintendent operates.

EDA 754 ISSUES IN SCHOOL FINANCE AND ECONOMICS 3

This course emphasizes the complexities pervasive in the world of public school finance. It is topic focused and designed to promote thoughtful decision making by school administrators with respect to school fiscal matters. Topics vary from term to term.

EDA 755 LEGAL ISSUES IN SCHOOL LEADERSHIP 3

This course addresses the statutes and judicial decisions which relate to schools and the responsibilities of boards of education, teachers, and administrators. Emphasis is placed on understanding the legal framework as it relates to providing quality education.

EDA 756 CONTRACT ISSUES IN SCHOOL LEADERSHIP 3

This course provides students with a history of the development of collective bargaining, the procedures and techniques of collective bargaining and contract management, and the role and responsibilities of administrators in carrying out these functions.

EDA 757 DECISION MAKING 3

The course's primary purpose is to have students develop an understanding of the art and science of decision making in the contexts of personal philosophy, the professional knowledge base, and practice.

EDA 758 THE POLITICS OF EDUCATIONAL LEADERSHIP 3

In this course practicing administrators will study the politics of education at all levels of the complex U.S. educational system. The micropolitics of the school site will also be studied, as will the political momentum behind educational trends. The effect of the political web of education on policymaking and administration will be analyzed. The goal of excellence in education for every child will be emphasized.

EDA 759 THE LAW OF SPECIAL EDUCATION 3

A review of pertinent legislation and litigation and litigation impacting on the rights of parents, students, and teachers involved in the process of providing a free appropriate public education for children with disabilities. Emphasis is placed on how teachers can, through an understanding of the law, facilitate active parent participation in the developmental progress of students. Teachers' specific responsibilities are described in relation to current requirements for development of appropriate educational programs.

EDA 807 EdS PROJECT SEMINAR 3

Completion of the research project is an integral part of this degree program. Students earn three semester hours of credit for the completion of their research project. This project will relate to the individual's coursework, interest, and work responsibilities.

EDA 810 CURRICULUM EVALUATION & INSTRUCTION 3

See EDA 710.

EDA 811 CURRICULUM DEVELOPMENT AND LEADERSHIP 3

See EDA 711.

EDA 812 PROGRAM AND STAFF DEVELOPMENT 3

See EDA 712.

EDA 816 BUSINESS AFFAIRS AND PHYSICAL RESOURCES 3

See EDA 716.

EDA 818 THE SUPERINTENDENCY 3

See EDA 718.

EDA 833 INTERNSHIP III 3

This experience is intended to provide the participant with an opportunity to relate the coursework, research, simulation, and independent study in which he/she has engaged to actual problems encountered in administration.

EDA 851 RESEARCH 3

This course is designed to provide practical application and issues in research as they relate to the educational leader. The objective of the course is the development of a proposal to conduct a research project which the student will finish prior to completion of the Educational Specialist degree program.

EDA 854 ISSUES IN SCHOOL FINANCE AND ECONOMICS 3

See EDA 754.

EDA 855 LEGAL ISSUES IN SCHOOL LEADERSHIP 3

See EDA 755.

EDA 856 CONTRACT ISSUES IN SCHOOL LEADERSHIP 3

See EDA 756.

EDA 857 DECISION MAKING 3

See EDA 757.

EDA 858 THE POLITICS OF EDUCATIONAL LEADERSHIP 3

See EDA 758.

EDA 859 THE LAW OF SPECIAL EDUCATION 3

See EDA 759.

EDU 801 INQUIRY, THEORY, AND QUALITATIVE RESEARCH 3

This course emphasizes the design of studies and the issues faced by researchers using qualitative methods. Focus is on field work methods in educational settings, specifically observation, interviewing, collecting written documents, using questionnaires, and data reduction and analysis. Also offered as EDU 901.

EDU 802 INTRODUCTION TO QUANTITATIVE RESEARCH AND STATISTICS 3

Course is designed to provide an introduction to the methods and techniques used in quantitative research methodology. Also offered as EDU 902.

EDU 808 IDEAS THAT SHAPE AMERICAN EDUCATION 3

Provides students the historical bases for policy decisions. The primary expectation is that students learn to use the history of education as a foundation for policy making. Also offered as EDU 908.

EDU 810 HUMANITIES IN EDUCATIONAL LEADERSHIP 1 - 3

In this doctoral seminar, students analyze humanities texts pertinent to the development of educational leaders. Particular attention is given to the function of narrative in moral inquiry and development.

EDU 811 INTELLECTUAL ISSUES IN THE DISCIPLINES 3

Prospective leaders will become familiar with intellectual issues in the realms of meaning so that they may lead their school faculties in examining the curricular implications of these issues. Also offered as EDU 911.

EDU 812 CULTURE OF THE SCHOOLS 3

Examination of the school culture and an analysis of how social, political, and environmental influences affect student behavior and teacher and administrator practices. Also offered as EDU 912.

EDU 813 HISTORY OF EDUCATIONAL ADMINISTRATION 3

A historical introduction to the development of educational administration as a profession; emphasis is placed on development of the knowledge base and its applicability to leaders who choose to be scholar-practitioners. Also offered as EDU 913.

EDU 841 HISTORY, PHILOSOPHY, AND CURRICULUM OF HIGHER EDUCATION 3

This course examines the evolution of higher education in the United States from the colonial era to the present. Particular attention is given to the purpose(s) and curriculum of higher education as they evolved in American society. Also offered as EDU 941.

EDU 842 STUDENT CHOICE IN HIGHER EDUCATION 3

This course examines the factors that influence student choice in higher education, including decisions about attending college, which college to attend, program of study, persistence, and graduate education. The ways in which student choice research can inform the development and refinement of enrollment management, student support services, and academic program development will also be analyzed and discussed. Also offered as EDU 942.

EDU 843 CRITICAL REFLECTION IN HIGHER EDUCATION LEADERSHIP 3

This course examines the convergence between the literature on reflective practice, leadership theory, and leadership in higher education. Particular attention is given to the role of critical reflection in improving the practice of leadership in higher education. Also offered as EDU 943.

EDU 844 BUILDING LEARNING COMMUNITIES IN HIGHER EDUCATION 3

This course examines the literature on governance in higher education, financial management in higher education, and the use of action inquiry methods. Also offered as EDU 944.

EDU 845 FINANCE AND POLICY IN HIGHER EDUCATION 3

This course examines the literature on public policy, public finance of higher education, and critical social issues in higher education. It will explore the role of government agencies in the funding and regulation of financial and social issues in higher education. Also offered as EDU 945.

EDU 846 LEGAL ISSUES IN HIGHER EDUCATION 3

This course examines the literature on the law and higher education. It will provide a perspective on what active higher education administrators need to know about legal issues. Also offered as EDU 946.

EDU 847 THE PROFESSORIATE 3

This course explores the historical development and cultural foundations of the faculty role especially the socialization process, values, work styles, career patterns, and the labor market. Research on the issues that impact faculty at all types of academic institutions is discussed. Also offered as EDU 947.

EDU 870 PHILOSOPHY OF EDUCATION SEMINAR 2

Study of classic and contemporary philosophical texts that address educational leadership issues from the perspective of a particular philosophical tradition, focus, or field.

EDU 890 CATHOLIC PHILOSOPHY OF EDUCATION SEMINAR 2

Study of classic and contemporary philosophical texts that address educational issues from the perspective of the Catholic intellectual tradition.

EDU 901 INQUIRY, THEORY, AND QUALITATIVE RESEARCH 3

This course emphasizes the design of studies and the issues faced by researchers using qualitative methods. Focus is on field work methods in educational settings, specifically observation, interviewing, collecting written documents, using questionnaires, and data reduction and analysis. Also offered as EDU 801.

EDU 902 INTRODUCTION TO QUANTITATIVE RESEARCH AND STATISTICS 3

Course is designed to provide an introduction to the methods and techniques used in quantitative research methodology. Also offered as EDU 802.

EDU 903 STATISTICS AND ADVANCED RESEARCH 3

Course is designed to extend the focus of EDU 902 with particular emphasis on experimental design methodology and the use of computer programs in analyzing research data.

EDU 904 DISSERTATION 9

Course is designed to provide each Ph.D. candidate the opportunity to pursue, with faculty guidance and support, inquiry on a topic of personal significance which also promises to add to the knowledge base of the profession.
Prerequisite(s): Successful completion of comprehensive examination.

EDU 905 CAPSTONE RESEARCH IN EDUCATIONAL LEADERSHIP 3

This is a seminar for doctoral students to learn about the dissertation process, committee member roles, and how all these factor into dissertation development and defense. Selected topics and the research questions must be approved by the student's chair. Students will produce a draft, Introduction, Review of Literature, and Method sections of their dissertation in preparation for presentation to their committee.

EDU 908 IDEAS THAT SHAPE AMERICAN EDUCATION 3

Provides students the historical bases for policy decisions. The primary expectation is that students learn to use the history of education as a foundation for policy making. Also offered as EDU 808.

EDU 911 INTELLECTUAL ISSUES IN THE DISCIPLINES 3

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A historical introduction to the development of educational administration as a profession; emphasis is placed on development of the knowledge base and its applicability to leaders who choose to be scholar-practitioners. Also offered as EDU 813.

EDU 914 ETHICS IN EDUCATIONAL LEADERSHIP 3

In this doctoral seminar, students carefully examine the moral dimension of decision-making in educational leadership. Particular attention is given to the development of a model for the articulation of moral views and its application to case situations.

EDU 919 INDEPENDENT STUDY 1 - 3

By permission of the program director only.

EDU 921 ORGANIZATIONAL THEORY 3

Development of organizational concepts that will help educational leaders become skilled organizational diagnosticians. Emphasis will be centered upon organizational behavior and how the leader can use the theories and research of the field in dealing with problems involving people.

EDU 922 ORGANIZATIONAL CHANGE AND DEVELOPMENT 3

Development of the fundamental concepts and procedures relative to effective planning. Applications of these concepts will also be made to program development and evaluation.

EDU 941 HISTORY, PHILOSOPHY, AND CURRICULUM OF HIGHER EDUCATION 3

This course examines the evolution of higher education in the United States from the colonial era to the present. Particular attention is given to the purpose(s) and curriculum of higher education as they evolved in American society. Also offered as EDU 841.

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EDU 944 BUILDING LEARNING COMMUNITIES IN HIGHER EDUCATION 3

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EDU 945 FINANCE AND POLICY IN HIGHER EDUCATION 3

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EDU 946 LEGAL ISSUES IN HIGHER EDUCATION 3

This course examines the literature on the law and higher education. It will provide a perspective on what active higher education administrators need to know about legal issues. Also offered as EDU 846.

EDU 947 THE PROFESSORIATE 3

This course explores the historical development and cultural foundations of the faculty role especially the socialization process, values, work styles, career patterns, and the labor market. Research on the issues that impact faculty at all types of academic institutions is discussed. Also offered as EDU 847.

EDU 990 CATHOLIC EDUCATION 3

AN ANALYSIS OF CHURCH DOCUMENTS AND COMMENTARIES: Study of the development of the history, principles, and issues of Catholic social teaching.

EDU 991 CATHOLIC SCHOOL 3

HISTORY AND FUTURE: Study of the history of the United States Catholic schools, elementary through university, within the political, social, economic, and religious context.

EDU 993 EFFECTIVE CATHOLIC SCHOOLS 3

Study of the application of leadership theory and behavior in the Catholic school setting.

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the Bulletin
AUGUST 2006 - GRADUATE ISSUE
→ Explore a Different Issue

School of Engineering

(ECE) Electrical and Computer Engineering (Collapse Description)

Malcolm W. Daniels, Chair of the Department

Programs (Collapse All)

Program Name

Doctorate of Engineering in Electrical and Computer Engineering (ECE)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Doctorate of Philosophy in Electrical and Computer Engineering (ECE)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Master of Science in Electrical and Computer Engineering (ECE)

The program of study leading to the Master of Science in electrical engineering must include a minimum of 30 semester hours of credit consisting of the following.

1. At least nine semester hours in electrical engineering core courses approved by the advisor/advisory committee, to be selected from:
   ECE 501 Contemporary Digital Systems
   ECE 503 Random Processes
   ECE 506 Microelectronic Devices
   ECE 507 Electromagnetic Fields I
   ECE 509 Analysis of Linear Systems
2. At least nine semester hours in a concentration area such as telecommunications, signals & systems, and digital systems, or as approved by the advisor/advisory committee.
3. At least six semester hours of selected technical electives. Selected courses must be approved by the advisor.
4. Six semester hours on an approved thesis or six hours of additional electrical engineering coursework. Students receiving 50% assistantship/stipend over one academic year or more will be required to pursue the thesis option.

See also Master's Degree Requirements in section X, School of Engineering in General Information.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
ECE 501	CONTEMPORARY DIGITAL SYSTEMS	3

Introduction to sequential logic; state machines; high-performance digital systems: theory and application of modern design; alternative implementation forms and introduction to HDL; productivity, recurring and non-recurring costs, flexibility, and testability; software drivers; hardware/software integration.
Prerequisite(s): ECE 215 or equivalent.

ECE 503 RANDOM PROCESSES 3

An introduction to random variables and processes as applied to system theory, communications, signal processing and controls. Topics include probability, random variables and processes, autocorrelation, power spectral density and linear system theory with random inputs. Applications in filtering and estimation.
Prerequisite(s): (ECE 202, 211) or equivalent.

ECE 506 MICROELECTRONIC DEVICES 3

Introduction to the theory of solid state devices; energy band theory; bulk properties of semiconductors; p-n junction, bipolar junction transistor, metal-oxide semiconductor (MOS), MOS capacitor, MOS field-effect transistor-theory, devices, modeling and applications.
Prerequisite(s): ECE 301 or equivalent.

ECE 507 ELECTROMAGNETIC FIELDS I 3

Fundamental concepts, wave equation and its solutions; wave propagation, reflection and transmission; potential theory; construction of solutions; various electromagnetic theorems: concept of source, uniqueness, equivalence, induction and reciprocity theorems.
Prerequisite(s): ECE 333 or equivalent.

ECE 509 ANALYSIS OF LINEAR SYSTEMS 3

State variable representation of linear systems and its relationship to the frequency domain representation using transfer functions and the Laplace transform. State transition matrix and solution of the state equation, stability, controllability, observability and state feedback are studied.

ECE 510 MICROWAVE CIRCUITS FOR COMMUNICATION 3

Microwave transmission, planar transmission lines, microwave components and filters. Microwave tubes, microwave communication, radar systems, and electronic support measures.
Prerequisite(s): ECE 507.

ECE 511 ANTENNAS 3

Fundamental principles of antennas; analysis and synthesis of arrays; resonant antennas; broadband and frequency independent antennas; aperture and reflector antennas; applications to radar and communication systems.
Prerequisite(s): ECE 442 or equivalent.

ECE 516 ELECTROMAGNETIC COMPATIBILITY 3

Fundamental principles of electromagnetic compatibility (EMC) including non-ideal behavior of components; radiated emissions and susceptibility; crosstalk; shielding and grounding; electrostatic discharge; system design for EMC.
Prerequisite(s): ECE 333, 511.

ECE 518 ELECTROMAGNETIC FIELDS II 3

Classification and construction of solutions. Plane cylindrical and spherical wave functions. Integral equations, mathematical theory of diffraction. Green's function.
Prerequisite(s): ECE 507.

ECE 521 DIGITAL COMMUNICATIONS I 3

Fundamental limits on performance; Shannon's theorem; prefix codes;Huffman codes; signal vectors; orthonormal basis functions; signal detection and estimation; Wiener and adaptive filters; matached filters; sampling theory and process; waveform coding techniques; baseband shaping concepts.
Prerequisite(s): ECE 503.

ECE 522 DIGITAL COMMUNICATIONS II 3

Waveform coding techniques, including binary and M-ary PAM, DPCM, DM, ADM; baseband shaping concepts, including binary and M-ary PAM, ISI; digital modulation techniques, including ASK, PSK, FSK, QPSK, CPFSK, MSK, DPSK, M-ary PSK; error-control, including Block codes, cyclic codes;

spread-spectrum modulation concepts.
Prerequisite(s): ECE 503.

ECE 531 MICROELECTRONICS SYSTEMS 3

Introduction to the design and application of engineering micro-electronics; bipolar and MOS device theory and processing technology; CMOS logic and circuitry; design principles fundamental to chip design and fabrication; case studies employing introduction to HDL.
Prerequisite(s): ECE 302.

ECE 533 COMPUTER DESIGN 3

Design considerations of the computer; register transfer operations; hardware implementation of arithmetic processors and ALU; instruction set format and design and its effect on the internal microengine; hardware and micro-programmed control design; comparative architectures.
Prerequisite(s): ECE 501 or equivalent.

ECE 536 MICROPROCESSOR APPLICATIONS 3

Project studies, applications of microprocessors in practical implementations; logic implementation using software; memory mapped I/O problems and interrupt structure implementation; use of assembler and/or cross assemblers; study of alternate microprocessor families including industrial controllers.
Prerequisite(s): ECE 314 or equivalent; ECE 501.

ECE 537 ADVANCED ENGINEERING SOFTWARE 3

Concepts, implementation, and current practice in the utilization of programming capabilities contained in operating systems. Introduction to operating system calls. A practical approach emphasizing theory and principles together with case studies and implementations in engineering applications of modern operating systems.
Prerequisite(s): C-programming experience.

ECE 538 OBJECT-ORIENTED PROGRAMMING APPLICATIONS 3

A semi-formal approach to the engineering applications of object-oriented programming. Application of the concepts of classes, inheritance, polymorphism in engineering problems. Introduction to the use of class libraries. Effective integration of the concepts of application programmer interfaces, language features and class libraries.
Prerequisite(s): C-programming experience.

ECE 545 AUTOMATIC CONTROL 3

Study of mathematical methods for control systems and analysis of performance characteristics and stability. Design topics include pole-placement, root locus, and frequency domain techniques. The student will also learn feedback loop sensitivity, basic loopshaping, performance bounds and other introductory aspects of robust control.
Prerequisite(s): ECE 509.

ECE 546 INSTRUMENTATION DESIGN 3

Theory of measurements: errors, accuracy, precision and bias. Analysis of measuring devices for various physical quantities such as motion, dimension, force, pressure and flow. Computer-aided experimentation. Automated data collection, recording, transmission and analysis. Virtual instrument design.

ECE 547 NONLINEAR SYSTEMS AND CONTROL 3

Introduction to nonlinear phenomena in dynamical systems. A study of the major techniques of nonlinear system analysis including phase plane analysis and Lyapunov stability theory. Application of the analytical techniques to control system design including feedback linearizatoin, backstepping and sliding mode control.
Prerequisite(s): ECE 509.

ECE 561 DIGITAL SIGNAL PROCESSING 3

A study of one-dimensional digital signal processing, including a review of continuous system analysis and sampling. Topics include z-transform techniques, digital filter design and analysis, and fast Fourier transform processing techniques.
Prerequisite(s): ECE 509.

ECE 563 IMAGE PROCESSING 3

An introduction to image processing including the human visual system, image formats, two-dimensional transforms, image restoration, and image reconstruction.
Prerequisite(s): ECE 561.

ECE 572 LINEAR SYSTEMS AND FOURIER OPTICS 3

Mathematical techniques pertaining to linear systems theory; Fresnel and Fraunhoffer diffraction; Fourier transform properties of lenses; frequency analysis of optical systems, spatial filtering, applications such as optical information processing and holography.
Prerequisite(s): Acceptance into the ECE graduate program or permission of the department chairperson.

ECE 573 ELECTRO-OPTICAL DEVICES & SYSTEMS 3

Solid-state theory of optoelectronic devices; photoemitters; photodetectors; solar cells; detection and noise; displays; electro-optic, magneto-optic, and acousto-optic modulators; integration and application of electro-optical components in electro-optical systems of various types.
Prerequisite(s): ECE 507 or permission of department chairperson.

ECE 574 GUIDED-WAVE OPTICS 3

Light propagation in slab and cylindrical waveguides; signal degradation in optical fibers; optical sources, detectors, and receivers; coupling; transmission link analysis; fiber fabrication; fiber sensor and communication systems.
Prerequisite(s): ECE 507 or permission of department chairperson.

ECE 575 ELECTRO-OPTICS SENSORS 3

Optical sensors, including amplitude, phase, wavelength, polarization and modal interference based sensors. Photoelasticity effects in stressed optical materials. Quadrature point stabilization, linearity, dynamic range and sensitivity. Modulation and demodulation by both passive and active means. General sensor characteristics. Optical sources and detectors, optical signal-to-noise ratio analysis and general sensor characteristics. Fiber optic sensors and smart skin/structure technology.
Prerequisite(s): ECE 574 or permission of department chairperson.

ECE 577L ELECTRO-OPTICS LABORATORY 1

Experimentation with E-O systems emphasizing areas such as display technology, surveillance systems and components, and other disciplines in which electronic and optical elements are arranged to interact synergistically.

ECE 595 SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING 2 - 6

Particular assignments to be arranged and approved by the department chair.

ECE 599 THESIS 1 - 6

ECE 603 APPLIED OPTIMAL ESTIMATION 3

Random processes and state-space analysis. Applied optimal estimation with emphasis on Kalman and Weiner filtering.
Prerequisite(s): (ECE 503 or 545) or equivalent.

ECE 611 ADVANCED ANTENNA THEORY 3

Advanced topics in antennas including advanced arrays, antenna temperature, synthetic apertures, aperture antennas, microwave traveling wave antennas.
Prerequisite(s): ECE 507, 511.

ECE 612 METHODS IN RADAR CROSS SECTION 3

Solution of problems in radar cross section analysis and prediction. RCS of simple shapes and complex shapes. Reflection and transmission; impedance boundary condition, stratified media. RCS of antennas. Application of the physical theory of diffraction and the geometrical theory of diffraction to scattering problems.
Prerequisite(s): ECE 507, 511.

ECE 615 COMPUTATIONAL ELECTROMAGNETICS 3

This course deals with both the differential equation and integral equation based methods to solve Maxwell's equations for complex bodies. Methods studied include the Moment Method, Finite Element Method, and Finite Difference Time Domain Method. The course also deals with asymptotic techniques leading to the formulation of the GTD and PTD.
Prerequisite(s): ECE 507, 518.

ECE 632 CONTEMPORARY MICROELECTRONICS DESIGN 3

CMOS analog circuit design (oscillators, amplifiers, op-amps), mixed signal design (data converters), introduction to microelectron-mechanical system (MEMS) and wireless communications systems design, advanced VLSI digital design projects, seminar topics covering contemporary designs and techniques.
Prerequisite(s): ECE 531.

ECE 636 ADVANCED COMPUTER ARCHITECTURE 3

Comparative evaluation of advanced and experimental computer structures. Investigation of optical, multiprocessor, array, various hybrid and neural network architectures. This is an advanced seminar class using current computer design and experimental literature.
Prerequisite(s): ECE 536.

ECE 637 CONCURRENT PROCESSING 3

Introduction to the concepts and practices of parallel processing and concurrency. Multiprogramming and multitasking. Synchronous and asynchronous events. Critical sections, mutexes and semaphores. Use of shared memory in engineering applications. Atomicity on CISC and RISC machines. Applications of interval timers. Case studies in engineering applications.
Prerequisite(s): (ECE 537, 636) or equivalent.

ECE 642 OPTIMAL CONTROL AND ESTIMATION 3

Optimal control of discrete-time systems. Cost-equivalent control of continuous-time systems. Optimal estimation.
Prerequisite(s): ECE 503, 545.

ECE 645 ADAPTIVE CONTROL 3

On-line approximation based adaptive control techniques for nonlinear systems. An introduction to neural networks and fuzzy systems as part of the control loop is given, leading to a diversity of advanced methods for controlling and stabilizing nonlinear systems subject to uncertainties. Adaptive observers and adaptive output feedback are also introduced.
Prerequisite(s): (ECE 509, 547) or permission of instructor.

ECE 661 STATISTICAL SIGNAL PROCESSING 3

This course studies discrete methods of linear estimation theory. Topics include random vectors, linear transformations, linear estimation theory, optimal filtering, least squares techniques, linear prediction, and spectrum estimation.
Prerequisite(s): ECE 561.

ECE 662 ADAPTIVE SIGNAL PROCESSING 3

An overview of the theory, design, and implementation of adaptive signal processors. This includes discussions of various gradient search techniques, filter structures, and applications. An introduction to neural networks is also included.
Prerequisite(s): ECE 661.

ECE 663 STATISTICAL PATTERN RECOGNITION 3

This course provides a comprehensive treatment of the statistical pattern recognition problem. The mathematical models describing these problems and the mathematical tools necessary for solving them are covered in detail.
Prerequisite(s): ECE 661.

ECE 674 INTEGRATED OPTICS 3

Asymmetric dielectric slab wave- guides; cylindrical dielectric wave-guides; multi-layer waveguides; dispersion, shifting and flattening; mode coupling and loss mechanisms; selected nonlinear waveguiding effects; integrated optical devices.
Prerequisite(s): ECE 574.

ECE 676 QUANTUM ELECTRONICS 3

Principles of the quantum theory of electron and photon processes; interaction of electromagnetic radiation and matter; applications to solid state and semiconductor laser systems.
Prerequisite(s): (ECE 506 or ECE 573 or EOP 506) or equivalent.

ECE 690 SELECTED READINGS IN ELECTRICAL ENGINEEERING 1 - 3

Directed readings in electrical engineering areas to be arranged and approved by the chair of the student's doctoral advisory committee and the department chair.

ECE 695 SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING 1 - 3

Special topics in electrical engineering not covered in regular courses. Course sections arranged and approved by the chair of the student's doctoral advisory committee and the department chair.

ECE 698 D.E. DISSERTATION 1 - 15

An original investigation as applied to electrical engineering practice. Results must be of sufficient importance to merit publication.

ECE 699 Ph.D. DISSERTATION 1 - 15

Original research in electrical engineering which makes a definite contribution to technical knowledge. Results must be of sufficient importance to merit publication.

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AUGUST 2006 - GRADUATE ISSUE
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School of Engineering

(EOP) Electro-Optics (Collapse Description)

Joseph W. Haus, Program Director

The interdisciplinary programs of study leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in electro-optics are administered by the School of Engineering with the cooperative support of the College of Arts and Sciences.

Programs (Collapse All)

Program Name

Doctorate of Philosophy in Electro-Optics (EOP)

The program of study in electro-optics leading to a Ph.D. degree must include a minimum of 90 semester hours beyond the bachelor's degree consisting of the following:

1. Twenty-one semester hours of core courses in electro-optics: EOP 501, 502, 505, 506, 513, 514, 541L, 542L and 543L, or equivalent.
2. Six semester hours of approved graduate mathematics courses.
3. Twelve semester hours of approved 600-level electro-optics courses.
4. Thirty semester hours of doctoral dissertation in electro-optics.

See also the Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the director of the electro-optics program.

Master of Science in Electro-Optics (EOP)

The program of study in electro-optics leading to a M.S. degree must include a minimum of 30 semester hours consisting of the following:

1. Twenty-one semester hours of core courses in electro-optics: EOP 501, EOP 502, EOP 505, EOP 506, EOP 513, EOP 514, EOP 541L, EOP 542L and EOP 543L.
2. Three semester hours of a technical elective.
3. Six semester hours of thesis work in the case of a thesis option or six semester hours of approved technical electives in the case of a non-thesis option.

While all students are expected to write a thesis, students supported by an assistantship are required to write a thesis. A request for thesis waiver is to be made at the start of the program of study. The procedure for this request is available from the electro-optics office. Students who have received a waiver of the thesis requirement must take an examination given by a three-person advisory committee just prior to their anticipated graduation date. The examination will be centered around an oral presentation on a topic mutually agreed to by the student and the advisory committee. At the discretion of the advisory committee, a written report may also be required. This committee and the topic must be selected before the last semester of study. The examination may be repeated once, but not in the same academic term.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the director of the electro-optics program.

Courses **(Collapse All Courses)**

Code	Title	Sem. Hrs.

EOP 501 GEOMETRIC OPTICS 3

Wavefronts and rays; Fermat's principle; Gaussian optics of axially symmetrical systems; aperture stops; pupils and field lenses; Lagrange invariant; angular and visual magnification; optical systems; plane mirrors and prisms; aberration theory; introduction to computer ray tracing.
Prerequisite(s): Acceptance into the graduate EO program or permission of program director.

EOP 502 OPTICAL RADIATION AND MATTER 3

Maxwell's equations; electromagnetic waves; interaction of radiation with atomic electrons; molecular and lattice vibration; study of phenomena related to the interaction of optical radiation with matter; polarization; crystal optics; nonlinear dielectric effects.
Prerequisite(s): Acceptance into the graduate EO program or permission of program director.

EOP 505 INTRODUCTION TO LASERS 3

Laser theory; coherence; Gaussian beams; optical resonators; properties of atomic and molecular radiation; laser oscillation and amplification; methods of excitation of lasers; characteristics of common lasers; laser applications.
Prerequisite(s): (EOP 502 or a working knowledge of Maxwell's Equations; physical optics) or permission of instructor or program director.

EOP 506 ELECTRO-OPTICAL DEVICES AND SYSTEMS 3

Solid state theory of optoelectronic devices; photoemitters; photodetectors; solar cells; detection and noise; displays; electro-optic, magneto-optic, and acousto-optic modulators; integration and application of electro-optical components in electro-optical systems of various types.
Prerequisite(s): EOP 502 or permission of instructor.

EOP 513 LINEAR SYSTEMS AND FOURIER OPTICS 3

Mathematical techniques pertaining to linear systems theory; Fresnel and Fraunhoffer diffraction; Fourier transform properties of lenses; frequency analysis of optical systems, spatial filtering, application such as optical information processing and holography.
Prerequisite(s): Acceptance into the graduate EO program or permission of program director.

EOP 514 GUIDED WAVE OPTICS 3

Light propagation in slab and cylindrical wave guides; signal degradation in optical fibers; optical sources, detectors, and receivers; coupling; transmission link analysis; fiber fabrication and cabling; fiber sensor system.
Prerequisite(s): EOP 502 or permission of program director.

EOP 523 TOPICS IN MODERN OPTICS 3

Infrared systems, including radiometry, blackbody and graybody sources, detectors, materials, and optics. Thin-film optical coatings. Polarization of light using Mueller matrices and Stokes vectors. Optical measurements and instruments based on polarization. Fast Fourier Transform (FFT) and its applications to optics.
Prerequisite(s): (EOP 506, 513) or permission of program director.

EOP 534 ELECTRO-OPTIC SENSORS 3

Optical sensors including amplitude, phase, wavelength, polarization, and modal interference based sensors. Photoelasticity effects in stressed optical materials. Quadrature point stabilization, linearity, dynamic range and sensitivity. Modulation and demodulation by both passive and active means. General sensor characteristics. Optical sources and detectors, optical signal-to-noise ratio analysis and general sensor characteristics. Fiber optic sensors and smart skin/structure technology.
Prerequisite(s): EOP 514 or permission of program director.

EOP 541L GEOMETRIC AND PHYSICAL OPTICS LABORATORY 1

Geometric optics; characterization of optical elements; diffraction; interference; birefringence and polarization.
Prerequisite(s): EOP 501 or permission of program director.

EOP 542L ELECTRO-OPTIC SYSTEMS LABORATORY 1

Fiber optic principles and systems: numerical aperture, loss, dispersion, single and multimode fibers, communications and sensing systems. Project oriented investigations of electro-fiber-optic systems and devices in general: sources, detectors, image processing, sensor instrumentation and integration, electro-optic component, display technology, nonlinear optical devices and systems.
Prerequisite(s): EOP 514 or permission of program director.

EOP 543L ADVANCED ELECTRO-OPTICS LABORATORY 1

Project-oriented investigations of laser characterization, interferometry, holography, optical pattern recognition and spectroscopy. Emphasis is on the applications of optics, electronics, and computer data acquisition and analysis to measurement problems.
Prerequisite(s): EOP 541L or permission of program director.

EOP 595 SPECIAL PROBLEMS IN ELECTRO-OPTICS 1 - 6

Particular assignments to be arranged and approved by the director of the program.

EOP 599 THESIS 3 - 6

EOP 601 OPTICAL DESIGN 3

Chromatic aberrations: doublet lens; telephoto, wide-angle, and normal lenses; triplet lens design and variations; optimization methods and computer lens design; optical transfer functions; telescopes and microscopes; two-mirror telescope design: aspheric surfaces; prism and folded optical systems, rangefinders; gratings and holographic optical elements; anamorphic optical systems; zoom systems.
Prerequisite(s): EOP 501.

EOP 603 INTERFEROMETRY 3

Two-beam interference: wavefront division, amplitude division, localization of fringes, and interferometers; coherence; multiple-beam interference; Fabry-Perot interference and fringes of equal chromatic order; length measurements.
Prerequisite(s): EOP 513.

EOP 604 INTEGRATED OPTICS 3

Review of electromagnetic principles; dielectric slab waveguides; cylindrical dielectric waveguides; dispersion, shifting and flattening; mode coupling and loss mechanism; selected nonlinear waveguiding effects; integrated optical devices.
Prerequisite(s): EOP 514.

EOP 621 STATISTICAL OPTICS 3

Optical phenomena and techniques requiring statistical methods for practical understanding and application; relevant statistical techniques for the analysis of image processing systems and the design of laser radar systems; engineering applications of statistical techniques.
Prerequisite(s): Completion of the core courses of the graduate electro-optics program or permission of program director.

EOP 624 NONLINEAR OPTICS 3

Introduction and overview nonlinear optical interactions, classical and harmonic oscillator model, symmetry properties of nonlinear susceptibility tensor, coupled-mode formalism, sum- and difference-frequency generation, parametric oscillators, four-wave mixing, phase conjugation, optical solutions, stimulated Brillouin and Raman scattering, photorefractive effect, and resonant nonlinearities.
Prerequisite(s): EOP 502 or equivalent.

EOP 625 LASER PROBE TECHNIQUES 3

Applications of optical phenomena and lasers to non-intrusive measurements; absorption and emission spectroscopies; laser-induced fluorescence spectroscopy; high-sensitivity detection methods using lasers; spontaneous and coherent Raman spectroscopies; Rayleigh and Mie scattering techniques; laser Doppler techniques; gas flow and combustion diagnostics and other applications of laser spectroscopy and light scattering.
Prerequisite(s): EOP 505 or permission of program director.

EOP 626 QUANTUM ELECTRONICS 3

Principles of the quantum theory of electron and photon processes; interaction of electromagnetic radiation and matter; applications to solid state and semiconductor laser systems.
Prerequisite(s): (ELE 506 or ELE 573 or EOP 506) or equivalent.

EOP 655 OPTICAL COMMUNICATIONS 3

To develop a practical understanding of the components and techniques used in current optical communication systems and to have an analytical understanding of their capabilities and limitations.
Prerequisite(s): EOP 502; basic knowledge of electromagnetism and linear algebra or permission of instructor.

EOP 665 POLARIZATION OF LIGHT: FUNDAMENTALS AND APPLICATIONS 3

The fundamentals and applications of the polarization properties of light; description of state of polarization; propagation of state of polarization; polarization devices; polarization in guided waves; polarization in multilayer thin films; ellipsometry and polarimetry; birefringent filters; spatially variant polarization; polarization in subwavelength structures.
Prerequisite(s): EOP 502; basic knowledge of electromagnetism and linear algebra or permission of instructor.

EOP 690 SELECTED READINGS IN ELECTRO-OPTICS 1 - 3

Directed readings in electro-optics areas to be arranged and approved by the chair of the student's advisory committee and the program director.

EOP 695 SPECIAL PROBLEMS IN ELECTRO-OPTICS 1 - 3

Special topics in electro-optics not covered in regular courses. Course sections arranged and approved by the chair of the student's advisory committee and program director.

EOP 699 Ph.D. DISSERTATION 1 - 15

Original research in electro-optics which makes a definite contribution to technical knowledge. Results must be of sufficient importance to merit publication.

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School of Engineering

(EGR) Engineering (Collapse Description)

Donald L. Moon, Program Director and Associate Dean, Graduate Engineering Programs and Research

The Master of Science in engineering allows flexibility for general or specialized program construction according to the needs of the individual student in conformance with the requirements of the School of Engineering and the University of Dayton.

Programs

Program Name

Master of Science in Engineering (EGR)

The program of study leading to the Master of Science in engineering must include a minimum of 33 semester hours of the following:

1. Fifteen semester hours in a major area.
2. Fifteen semester hours of electives.
3. Three semester hours of research on an approved project.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the director of the Master of Science in engineering program.

Explore by Department:

Educational Leadership
Electrical and Computer Engineering
Electro-Optics
Engineering

Explore

Explore by Program:

Educational Leadership (EDA)
Electrical and Computer Engineering (ECE)
Electro-Optics (EOP)
Engineering (EGR)

Explore

Explore by Courses:

Aerospace Engineering (AEE)
Biology (BIO)
Business Administration (MBA)
Chemical Engineering (CME)

Explore

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School of Engineering

(ENM) Engineering Management (Collapse Description)

Patrick J. Sweeney, Chairperson of the Department of Engineering Management & Systems

The program of study leading to the Master of Science in engineering management is designed to prepare the practicing engineer to manage engineering activities in industry, government, business, and the military. Graduates should be able to model, analyze, and make the difficult decisions required of engineering leaders, after learning course methodologies in statistics, operations research and simulation, and practicing these methodologies by using data and current analytical tools to solve real-world problems. Check us out at: http://engineering.udayton.edu/programs/management

You do not have to interrupt your career to earn a master's degree in engineering management or management science. For the convenience of our students, courses are offered:

- On campus. Traditional on-campus classes once per week - usually in late afternoon or early morning.

- On site. Given sufficient enrollment, classes maybe offered at employer work sites.

- Through distance learning. Courses are offered live to off campus locations - primarily work sites.

Programs

Program Name

Master of Science in Engineering Management (ENM)

The program of study leading to the Master of Science in engineering management is designed to prepare the practicing engineering to manage negineering activities in industry, government, business, and the military. Building on foundational coursework in statistics, operations research, and and simulation, and by practicing these methodologies using data and current analytical toolds to solve real-world problems, Graduates should be able to model, analyze, and make the difficult decisions required of simulation, and practicing these methodologies by using data and current analytical tools to solve real-world problems.

The program includes a minimum of 36 semester hours consisting of the following:

1. Twenty-one semester hours of core courses in engineering management: ENM 500, MSC 521, ENM 530, MSC 572, ENM 582, and ENM 590.
2. Nine semester hours of supporting electives approved by the advisor, consisting of one course from Group 1 electives and two courses from the Group 2 electives listed below. In exceptional cases, the advisor may approve other engineering electives.

- Group 1 ENM Electives (select one): ENM 515, ENM 517, ENM 539, ENM 585, MBA 620, MBA 650 and 660. (If elected, both MBA 650 and 6550 must be taken to satisfy this requirement.)

- Group 2 ENM Electives (select two): ENM 534, ENM 541, MSC 555, ENM 560, ENM 561, ENM 562, ENM 565, MSC 572. (ENM 555 or MSC 572 may be taken as a supporting elective only if not used to satisfy the core course requirements.)

3. Six semester hours of engineering electives approved by the advisor. The requirement mayb be satisfied with six semester hours of courses in other fields of

engineering, including engineering management and management science.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

The supporting and engineering electives within the program of study allows concentrations in areas such as six sigma quality, manufacturing, artificial intelligence, reliabilityengineering, operations research, and simulation.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.

ENM 500 PROBABILITY & STATISTICS FOR ENGINEERING 3

Concepts and methods of probability and statistics as applied to describing, formulating, modeling and solving engineering and operations research/management science problems. Topics include descriptive statistics, probability modeling, inferential statistics, and related statisical methods. Collectively, these methods and techniques allow the student to solve problems involving data, uncertainty , random processes, and random events and have direct application in solving problems in volving forecasting, queing, inventory, production, scheduling, reliability, quality control, experimental design, robust engineering six sigma, and more.
Prerequisite(s): ENM 503 or (MTH 218, 302) or equivalent.

ENM 501 APPLIED ENGINEERING STATISTICS 3

Concepts and applications of advanced probability modeling and statistical techniques used in the study and solution of operations research/management science problems. The focus of this course is on the application of probability and statistics in the formulation and solution of models found in OR studies and in engineering design studies. This course builds upon the foundation established in the ENM 500 course.
Prerequisite(s): ENM 500 or equivalent.

ENM 503 ENGINEERING ANALYSES - METHODS AND MODELS 3

Mathemetical methods and models used in the study and solution of decision problems found in engineering and operations research/management science. The methods and models presented build on the student's mathematical foundation and are motivated by their use in solving real-world problems. This is not a concept-theory course but rather a course designed to enhance the modeling and analysis skills of the student.
Prerequisite(s): An undergraduate course sequence in calculus.

ENM 505 CASE STUDIES - DESIGN IN ENGINEERING 3

This course provides an introduction to the functions and tools of engineering management and the systems engineering process. Topics include the roles of engineering managers and the relationships of engineering activities to the total enterprise, system approaches to engineering design and problem solving, tools and methods for managing complex systems, and the application of these processes and methods. Application is addressing through several engineering design and problem solving excersises and the development of each student's engineering case study (ENM 590) proposal.
Prerequisite(s): ENM 582; MSC 521.

ENM 515 HUMAN FACTORS ENGINEERING 3

An introduction to the human factors criteria that are an integral part in the design of man-machine systemof man-machine systems, work situations, and man's physical environment.

ENM 517 LEGAL ASPECTS OF ENGINEERING 3

An introductory course to provide the engineer with some insight into the areas of law that will impact an engineer's professional practice. Special emphasis is given to the area of Contract Law due to the important and pervasive interaction that it has with engineering design and project work. Systems of law, legal reasoning, and the court systems are introduced. Product liability and business relationships are discussed. Courtroom

experience is achieved through interaction with the UD Law School and local judges with participation in mock trials.

ENM 530 COST AND ECONOMIC ANALYSIS FOR ENGINEERS 3

Principles and methods of economic analysis of engineering activities, including the time value of money. Short- and long-term investments, comparison of alternatives, depreciation analysis, replacement analysis, and minimum cost models are covered in detail.

ENM 534 DECISION MAKING 3

Introduction to rational decision-making with applications in the analysis and design of engineering and management systems. Topics explored are decision-making under uncertainty and risk as well as under certainty, group decision-making, multiple-criteria decision-making, naturalistic and practical decision making.
Prerequisite(s): ENM 500 or equivalent.

ENM 539 APPLIED PROGRAM MANAGEMENT 3

A graduate course for corporate and government managers that emphasizes the concepts, techniques and procedures used to manage programs or projects. The course provides a complete overview of the quantitative project management tools and methodologies used to plan, control and execute programs or projects. Course topics include project screening and selection; multiple-criteria methods for evaluation; work breakdown structures (WBS) and organization; configuration selection, management and control; project scheduling; project budgets; resource management; research and development projects; computer support for project management.
Prerequisite(s): ENM 505, 582.

ENM 541 PRODUCTION ENGINEERING 3

Study of the integration of man, machine, and material in producing a marketable product. The use of engineering techniques to design, develop, and implement the production system are covered. Topics include break-even analysis, learning curve theory, forecasting, resource balancing, inventory and production control, facility layout and location, job sequencing and scheduling, and assembly line balancing. Modern production techniques such as just-in-time (JIT), MRP systems flexible manufacturing, and computer-integrated manufacturing are discussed.
Prerequisite(s): MSC 521 or permission of instructor.

ENM 560 QUALITY ASSURANCE 3

Introduction to the fundamental concepts and methods of modern approaches to quality assurance, with emphasis on statistical methods for process control, process capability analysis, and sampling inspection. The course introduces relevant methods of experimental design and current issues in quality improvement.
Prerequisite(s): ENM 500 or equivalent.

ENM 561 DESIGN AND ANALYSIS OF EXPERIMENTS 3

This course introduces advanced topics in experimental design and analysis, including full and fractional factorial designs, response surface analysis, multiple and partial regression, and correlation.
Prerequisite(s): ENM 500 or equivalent.

ENM 562 ROBUST ENGINEERING 3

Robust engineering methods lead to products and processes that function well in spite of variable customer environments and usage patterns, internal deterioration and ageing of components, and unit-to-unit variation in subassemblies. The key concept is using experimental design to neutralize these sources of performance variablity. This course presents the still vital Taguchi methods that pioneered the methodology as well as modern work to improve on and expand Taguchi's principals.
Prerequisite(s): ENM 500 or equivalent.

ENM 565 RELIABILITY ENGINEERING I 3

An introduction to reliability engineering concepts and methodology. The reliability, maintainability, and availability of components and multi-component systems are analyzed. Topics include exponential, Weibull, lognormal and normal failure laws, static reliability, hazard rate functions, state dependent failure rate models, redundancy, censoring, empirical models, curve fitting to failure data, and reliability growth testing.
Prerequisite(s): ENM 500 or equivalent.

ENM 566 RELIABILITY ENGINEERING II 3

Continuation of ENM 565 with emphasis on the design of systems to meet specified reliability, availability, and maintainability requirements.
Prerequisite(s): ENM 565 or equivalent.

ENM 582 ORGANIZATIONAL DEVELOPMENT IN AN ENGINEERING ENVIRONMENT 3

This course covers organizational design and the interpersonal and group skills needed by the engineering manager. Emphasis is placed on establishing good work environments through communication, trust, high morale, satisfaction, and productive group activity. Special topics covered include TQM implementation, high performing teams, and other current issues.

ENM 585 ORGANIZATIONAL SYSTEMS 3

Introduction to organizational theory and practice with emphasis on the design of organizational structures for the effective integration of production, research and development, and engineering activities. Special topics include high performing systems, the technical ad-hoc committee, matrix organization, and project management and other current issues.

ENM 590 CASE STUDIES IN ENGINEERING MANAGEMENT 3

This capstone course emphasizes the completion of an engineering management project or study under the direction of a faculty advisor. A well-written report is required.
Prerequisite(s): Completion of the engineering management core courses or equivalent.

ENM 595 SPECIAL PROBLEMS IN ENGINEERING MANAGEMENT 3

This course covers special assignments in engineering management as arranged and approved by the advisor and the program director.

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School of Engineering

(EGM) Engineering Mechanics (Collapse Description)

Faris A. Malhas, Chair of the Department

Programs

Program Name

Master of Science in Engineering Mechanics (EGM)

The program of study for the degree of Master of Science in engineering mechanics requires a minimum of 33 semester hours of credit consisting of the following:

1. Twelve required semester hours in engineering mechanics: EGM 500, 503, 533, and 546.
2. Nine elective semester hours in engineering mechanics.
3. Six required semester hours in mathematics: MTH 535 and 551.
4. Six semester hours of research on an approved project or thesis. Thesis or project research may be replaced by nine semester hours of additional coursework only with the approval of both the advisor and the program director.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the advisor.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
EGM 500	INTRODUCTION TO NUMERICAL METHODS	3

Numerical analysis topics include the solution of systems of linear and nonlinear algebraic equations; matrix eigenvalue problems; ordinary differential equations; optimization techniques; numerical integration and interpolation. Engineering applications presented. Computer programming required.

EGM 502	ADVANCED ENGINEERING ANALYSIS	3

Detailed analysis of engineering problems using laws of nature, fundamental engineering principles, mathematics, computers, and practical experience to construct, resolve, and test analytic models of physical events. Emphasis is on the use of the professional engineering approach which includes formulation of the problem, assumptions, plan or method of attack, solving the problem, and checking and generalizing results.

EGM 503	INTRODUCTION TO CONTINUUM MECHANICS	3

Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics.
Prerequisite(s): EGM 303.

EGM 504	FUNDAMENTALS OF FLUID MECHANICS	3

An advanced course in fluid mechanics with emphasis on the derivation of conservation equations and the application of constitutive theory. Navier-Stokes equations. Ideal fluid approximation. Exact and approximate solutions to classical viscous and inviscid problems. Compressible and incompressible flows.
Corequisite(s): EGM 503.

EGM 506 MECHANICAL BEHAVIOR OF MATERIALS 3

Fundamental relationships between the structure and mechanical behavior of materials. Includes fundamentals of stress and strain, the physical basis for elastic deformation, elementary dislocation theory and plastic deformation, strengthening mechanisms, yield criteria and their application to biaxial and multi-axial behavior and failure, fracture and toughening mechanisms, creep and creep rupture, behavior and failure of cellular solids, and fatigue.
Prerequisite(s): EGM 303.

EGM 511 EXPERIMENTAL STRESS ANALYSIS 3

A study of the experimental analysis of stress as an aid to design for strength and economy with emphasis on electrical strain gages. Also, photoelasticity, brittle coatings, analogies, structural similitude. Two hours lecture and one three-hour laboratory period per week.
Prerequisite(s): EGM 303.

EGM 519 ANALYTIC DYNAMICS 3

Dynamical analysis of a system of particles and rigid bodies; Lagrangian and Hamiltonian formulation of equations of motion; classical integrals of motion; stability analysis of linear and nonlinear systems.
Prerequisite(s): EGM 202; MTH 219.

EGM 531 THEORY OF LINEAR VISCOELASTICITY 3

Principles of viscoelasticity; Kelvin and Maxwell models of viscoelastic materials; creep and relaxation phenomena; application of hereditary integral and complex compliance; correspondence principle; wave propagation and vibrational response.
Prerequisite(s): EGM 303; MTH 219.

EGM 533 THEORY OF ELASTICITY 3

Three-dimensional stress and strain at a point; equations of elasticity in Cartesian and curvilinear coordinates; methods of formulation of equations for solution, plane stress and plane strain; energy formulations; numerical solution procedures.
Prerequisite(s): EGM 303.
Corequisite(s): EGM 503.

EGM 534 THEORY OF PLATES AND SHELLS 3

Theory of plates; small and large displacement theories of thin plates; shear deformation; buckling; sandwich plate theory. Thin shell theory; theory of surfaces; thin shell equations in orthogonal curvilinear coordinates; bending, membrane, and shallow shell theories.
Prerequisite(s): EGM 533.

EGM 536 RANDOM VIBRATIONS 3

Introduction to probability distribution; characterization of random vibrations; harmonic analysis; auto- and cross-correlation and spectral density; coherence; response to single and multiple loadings; Fast Fourier Transform (FFT); applications in vibrations, vehicle dynamics, fatigue, etc.
Prerequisite(s): MEE 319; computer programming.

EGM 538 INTRODUCTION TO AEROELASTICITY 3

Study of the effect of aerodynamic forces on a flexible aircraft. Flexibility coefficients and natural modes of vibration. Quasi-steady aerodynamics. Static aeroelastic problems; wing divergence and dynamic aeroelasticity; wing flutter. An introduction to structural stability augmentation with controls.
Prerequisite(s): AEE 501.

EGM 539 THEORY OF PLASTICITY 3

Fundamentals of plasticity theory including elastic, viscoelastic, and elastic-plastic constitutive models; plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures.
Prerequisite(s): EGM 503 or 533.

EGM 540 COMPOSITE DESIGN 3

Design with composite materials. Micromechanics. Lamination theory. Joining. Fatigue. Environmental effects.
Prerequisite(s): EGM 303.

EGM 541 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3

Introduction to the mechanical response of fiber-reinforced composite materials with emphasis on the development of experimental methodology. Analytical topics include stress-strain behavior of anisotropic materials, laminate mechanics, and strength analysis. Theoretical models are applied to the analysis of experimental techniques used for characterizing composite materials. Lectures are supplemented by laboratory sessions in which characterization tests are performed on contemporary composite materials.
Prerequisite(s): EGM 303.

EGM 543 ANALYTICAL MECHANICS OF COMPOSITE MATERIALS 3

Analytical models are developed for predicting the mechanical and thermal behavior of fiber-reinforced composite materials as a function of constituent material properties. Both continuous and discontinuous fiber-reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micro-mechanics and lamination theory, free edge effects, and failure criteria.
Prerequisite(s): EGM 303.

EGM 544 MECHANICS OF COMPOSITE STRUCTURES 3

Comprehensive treatment of laminated beams, plates, and sandwich structures. Effect of heterogeneity and anisotropy on bending under lateral loads, buckling, and free vibration are emphasized. Shear deformation and other higher-order theories and their range of parametric application are also considered.
Prerequisite(s): EGM 543 or permission of instructor.

EGM 545 COMPUTATIONAL METHODS FOR DESIGN 3

Modeling of mechanical systems and structures, analysis by analytical and numerical methods, development of mechanical design criteria and principles of optimum design and analysis, use of the digital computer as an aid in the design of mechanical elements.
Prerequisite(s): Computer programming.

EGM 546 FINITE ELEMENT ANALYSIS I 3

Fundamental development of the Finite Element Method (FEM) and solution of field and structural problems. Variational principles and weak, forms; finite element discretization; shape functions; finite elements for field problems; bar, beam, plate, and shell elements; isoparametric finite elements; stiffness, nodal force, and mass matrices; matrix assembly procedures; computer coding techniques; modeling decisions; program output interpretation. Emphasis on a thorough understanding of FEM theory and modeling techniques.
Prerequisite(s): EGM 503 or 533.

EGM 547 FINITE ELEMENT ANALYSIS II 3

Advanced topics: heat transfer; transient dynamics; nonlinear analysis; substructuring and static condensation; effects of inexact numerical integration and element incompatibility; patch test; frontal solution techniques; selected topics from the recent literature.
Prerequisite(s): EGM 546.

EGM 548 ENERGY METHODS IN SOLID MECHANICS 3

Development of fundamental energy principles; virtual displacements, strain energy, Castigliano's theorems, minimum potential energy principles. Applications to engineering problems; redundant structures, buckling, static and dynamic analysis.

Prerequisite(s): EGM 503 or 533.

EGM 549 THEORY OF ELASTIC STABILITY 3

Introduction to stability theory; buckling of plates and shells; influence of initial imperfections; nonlinear analysis; numerical solution methods.
Prerequisite(s): EGM 533.

EGM 552 BOUNDARY LAYER THEORY 3

Development of the Prandtl boundary layer approximation in two and three dimensions for both compressible and incompressible flow. Exact and approximate solutions for laminar flows. Unsteady boundary layers. Linear stability theory and transition to turbulence. Empirical and semi-empirical methods for turbulent boundary layers. Higher order boundary layer theory.
Prerequisite(s): EGM 504 or equivalent.

EGM 553 COMPRESSIBLE FLOW 3

Fundamental equations of compressible flow. Introduction to flow in two and three dimensions. Two-dimensional supersonic flow, small perturbation theory, method of characteristics, oblique shock theory. Introduction to unsteady one-dimensional motion and shock tube theory. Method of surface singularities.
Prerequisite(s): EGM 503.

EGM 570 FRACTURE MECHANICS 3

Application of the principles of fracture mechanics to problems associated with fatigue and fracture in engineering structures. Development of models that apply to a range of materials, geometries, and loading conditions.
Prerequisite(s): EGM 506 or permission of instructor.

EGM 575 FRACTURE AND FATIGUE OF METALS AND ALLOYS I 3

Effects of microstructure on the fracture and fatigue behavior of engineering metals and alloys with the special emphasis on static and dynamic brittle and ductile failures and static and fatigue crack initiation. Alloy fracture resistance, fracture toughness, fatigue behavior, and methods to improve fracture and fatigue behavior will be discussed in detail. Various analytical techniques for failure analysis of structural components will be presented. A practical failure analysis project will be performed.
Prerequisite(s): (MAT 501 or 506) or permission of instructor.

EGM 576 FRACTURE AND FATIGUE OF METALS AND ALLOYS II 3

Effects of microstructure on fatigue crack propagation and on final fracture by fatigue. This will include fatigue life prediction, using a damage-tolerance approach to component design and microstructural and structural synthesis for optimum behavior. Specific material-related aspects of fatigue crack propagation mechanisms for optimum damage tolerant behavior and the failure analysis will also be covered. A comprehensive project in failure-analysis of aerospace metallic components will also be conducted.
Prerequisite(s): MAT 575 or equivalent.

EGM 590 SELECTED READINGS IN ENGINEERING MECHANICS 1 - 3

Directed readings in a designated area, arranged and approved by the student's faculty advisor and the department chair. May be repeated.

EGM 595 SPECIAL PROBLEMS IN ENGINEERING MECHANICS 1 - 6

Special topics arranged and approved by the student's faculty advisor and the department chair.

EGM 598 PROJECT 1 - 6

EGM 599 THESIS 1 - 6

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College of Arts and Sciences

(ENG) English (Collapse Description)

Brian P. Conniff, Chair of the Department
Margaret M. Strain, Graduate Program Director

The English graduate program leading to the Master of Arts degree allows students to concentrate in one of the following track options: 1) English and American literature; 2) writing; and 3) teaching.

The program accommodates both full-time and part-time students, allows them to achieve different goals, and prepares them for a wide variety of careers. The English and American literature track serves prospective Ph.D. students in literature and students generally seeking greater literary understanding or research skills; the writing track prepares students who go on to doctoral programs in rhetoric, composition, and writing as well as those seeking careers in professional, business, technical, or creative writing; the teaching track provides students with advanced work in the content area for teachers of English.

Assistantships

Graduate teaching assistantships are offered to qualified students in the M.A. program. The assistantship is an apprenticeship in teaching first-year composition as part of the undergraduate writing program. Assistants receive pedagogical and curricular instruction in all aspects of the writing process, preparing them to teach expository, argumentative, and researched essays. Students making satisfactory progress toward their degree may renew their contract for a second year.

Teaching assistants can also choose to work in computer-mediated environments or participate in special programs such as the Building Communities for Social Justice Cohort. Occasionally, opportunities arise for writing internships with the Department of Public Relations. Awards provide tuition remission for the 30-hour program, a stipend, and benefits. Applications for assistantships are part of the online admission form.

Programs

Program Name

Master of Arts in English (ENG)

Normally 30 semester hours are required. Every student both in the literary track and in the teaching track who has attained a grade point average of at least 3.00, after completing 12 hours of graduate work, will take a Diagnostic Examination. This examination will be reviewed by a faculty committee consisting of the candidate's advisor, the graduate program director, and another member of the graduate faculty or staff.

Every student in the writing track who has attained a grade point average of 3.00, after completing 12 hours of graduate work, will begin a Diagnostic Writing Assignment with the approval of the student's advisor. This assignment will ordinarily be completed during the same term in which it is approved by the advisor, and the finished assignment will be assessed by a faculty committee consisting of the advisor, the graduate program director, and a third member of the graduate faculty or staff. On the basis of the Diagnostic Examination or the completed Diagnostic Writing Assignment as well as other materials pertaining to the student's graduate performance, the evaluating committee will make

recommendations to the department chair about the candidate's graduate program. Among these recommendations will be the total number of hours that the candidate needs to complete the degree. Exceptionally well-prepared students may earn the master's degree in fewer than 30 hours; students with deficiencies may be required to take up to 36 semester hours of graduate study.

ENG 601, Research and Bibliography, is required of applicants for the degree. ENG 588, Studies in Criticism, is required of each student in the literature track who has not taken a satisfactory undergraduate course in literary criticism and theory. ENG 596, Composition Theory, is required of each applicant in the writing track. Students in the teaching track may select either course to fulfill their theory requirement. In addition, EDT 500 Models, of Teaching, and EDT609, Issues, Trends and Research in Reading, are required of each student in the teaching track.

All students must take at least 12 hours of 600-level courses (including ENG 601 and EDT 609 for teachers). Students in the teaching track are required to take two of these 600-level courses in literature or composition pedagogy (ENG 621, ENG 625 or the equivalent). Graduate assistants are required to take the one-credit course, ENG 590, Teaching of College English, during each year of their assistantship.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
ENG 505	CREATIVE WRITING	3

Supervised practice in various literary forms. Both group discussions and individual conferences and critiques. Permission of chair required.

Code	Title	Sem. Hrs.
ENG 507	STUDIES IN WRITING	1 - 6

Special topics in composition, argumentation, technical writing, report writing, and the like.

Code	Title	Sem. Hrs.
ENG 514	MEDIEVAL ENGLISH LITERATURE	3

A study of the dominant types in the literature of England from the beginning to 1500.

Code	Title	Sem. Hrs.
ENG 515	CHAUCER	3

A study of the life, the times, and language of Chaucer. The main concentration is on The Canterbury Tales as rendered in Middle English.

Code	Title	Sem. Hrs.
ENG 522	EARLY RENAISSANCE LITERATURE	3

A survey of the literature of the sixteenth century from Thomas More to Sidney and Spenser.

Code	Title	Sem. Hrs.
ENG 524	SHAKESPEARE	3

A study of significant aspects of Shakespeare's plays and poems.

Code	Title	Sem. Hrs.
ENG 532	LATER RENAISSANCE LITERATURE	3

A survey of the literature of the early seventeenth century from Bacon, Johnson, and Donne to Marvell, exclusive of Milton.

Code	Title	Sem. Hrs.
ENG 536	STUDIES IN DRAMA TO 1642	3

Studies in English drama from the beginning to the closing of the theatres.

Code	Title	Sem. Hrs.
ENG 538	MILTON	3

A study of the major and minor poems and selected prose of Milton.

Code	Title	Sem. Hrs.
ENG 542	STUDIES IN NEO-CLASSICAL LITERATURE	3

Studies in literature from Dryden to Johnson.

Code	Title	Sem. Hrs.
ENG 552	ENGLISH ROMANTICISM	3

A study of the major poets and critics of the Romantic Age.

Code	Title	Sem. Hrs.
ENG 556	STUDIES IN NINETEENTH-CENTURY LITERATURE	3

A study of the literature in England in the nineteenth century.

ENG 560 TWENTIETH-CENTURY BRITISH LITERATURE 3
A consideration of significant developments in modern British literature.

ENG 572 AMERICAN ROMANTICISM 3
A study of significant developments in American literature of the mid-nineteenth century.

ENG 576 MAJOR AMERICAN WRITERS 3
An intensive comparative study of two or three American writers.

ENG 580 AMERICAN REALISM AND NATURALISM 3
A study of representative writers from the post-Civil War period in American literature.

ENG 584 STUDIES IN TWENTIETH-CENTURY AMERICAN LITERATURE 3
A study of significant developments in American literature of the twentieth century.

ENG 585 HISTORY OF RHETORIC 3
A history of rhetoric from the classical to the modern age.

ENG 587 CONTEMPORARY RHETORIC 3
An examination of one or more contemporary forms of argumentation and their application in writing.

ENG 588 STUDIES IN CRITICISM 3
A treatment of significant topics in theoretical and/or practical criticism.

ENG 590 TEACHING OF COLLEGE ENGLISH 1
Discussion, instruction, and practice in the methods of teaching composition and literature. Required of and open only to graduate assistants.

ENG 591 STUDIES IN LITERATURE 1 - 6
An analysis of selected literary problems or areas.

ENG 592 HISTORY OF ENGLISH 3
A study of stages in the development of the English language and of influences shaping its development from the beginning to the present time.

ENG 594 THE STRUCTURE OF ENGLISH 3
Studies in the grammatical structure of modern English in the light of historical development. Traditional and modern linguistic points of view are considered.

ENG 596 COMPOSITION THEORY 3
Study of the principal current theories of composition, with application to the teaching and evaluating of writing.

ENG 599 THESIS 3 - 6

ENG 601 RESEARCH AND BIBLIOGRAPHY 3
An introduction to the methods and tools of literary scholarship. Required of all degree applicants.

ENG 605 STUDIES IN AN AUTHOR 3
A consideration of the body of an author's work and its relationship to the life of the author.

ENG 609 STUDIES IN A GENRE OR MODE 3
An intensive analysis of a significant literary form or mode.

ENG 613 STUDIES IN A LITERARY MOVEMENT 3

An analysis of a significant literary school, group, or movement.

ENG 621 STUDIES IN THE TEACHING OF LITERATURE 3

An exploration of ways to teach literature more effectively for particular students.

ENG 625 STUDIES IN THE TEACHING OF COMPOSITION 3

An exploration of ways to teach writing more effectively for particular groups of students.

ENG 627 PROFESSIONAL WRITING 1 - 3

Analysis of and practice in professional writing in different contexts, for example, proposal writing, evaluative report writing, and editing skills.

ENG 629 WRITING NON-FICTION 3

Study of and practice in the writing of non-fiction texts, such as essays, biography, letters, diaries, travel accounts, sermons.

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College of Arts and Sciences

(GEO) Geology (Collapse Description)

Dr. Don Pair, Chair of the Department

* There is not a graduate program in geology at this time. The course listed below supports other graduate programs.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
GEO 501	GEOLOGY, LANDSCAPE, AND ENVIRONMENT OF THE MIAMI VALLEY	3

Investigation of the geologic processes and history of the landscape of the Miami Valley; assessment of the impact of human activity on the environment. Examination of the significance of local events as a reflection of global events and global change. This is primarily a field-based course for both teachers of science and those with no science teaching experience.

Explore by Department:

Engineering Management
Engineering Mechanics
English
Geology

Explore

Explore by Program:

Adolescence to Young Adult Educatio... (EDT)
Aerospace Engineering (AEE)
Applied Mathematics (MAS)
Art Education (MSE.EAR) (EDT)

Explore

Explore by Courses:

Engineering Management (ENM)
Engineering Mechanics (EGM)
English (ENG)
Geology (GEO)

Explore

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School of Education and Allied Professions

(HSS) Health and Sport Science (Collapse Description)

Until further notice, applications are not being accepted for the Master of Science in Education, Physical Education Specialization.

Paul M. Vanderburgh, Chair of the Department

The Department of Health and Sport Science offers a Master of Science in Education (M.S.Ed.) in exercise science. The M.S.Ed. in exercise science is designed to prepare individuals for careers in exercise science, corporate fitness, wellness, or personal training as well as for doctoral study in the exercise sciences. It has a scientific base which includes a substantive research emphasis. Graduates will also be prepared for the American College of Sports Medicine or National Strength and Conditioning Association certification exams. The degree requires a research/capstone project that must be submitted to a professional journal for publication prior to graduation.

Advising

The coordinator of the graduate program within the department will act as the student's academic advisor. A personalized program will be planned with the student during the first term of enrollment in an effort to meet the student's professional and personal goals and needs. The coordinator will also counsel the student on the purpose and requirements of graduate work, selection of courses, and the options available within the department.

Assistantships

There are several graduate assistantships (GA) available within the Department of Health and Sport Science. In return for tuition remission and a stipend, GAs teach courses, labs, assist faculty with research, and participate in other departmental activities as appropriate. Those interested in GA positions should contact the department chair.

Programs

Program Name

Master of Science in Exercise Science (EXS)

A minimum of 30 semester hours is required. Students must achieve an average of at least B (3.0) in all work undertaken to qualify for graduation. Students who receive grades of C or less in two courses will be dismissed from the program.

			Sem. Hrs.
Exercise Science			**30**
Research Component			
HSS	555	SURVEY OF RESEARCH PROCESSES AND DESIGN IN SPORT SCIENCE	3
HSS	560	EVALUATION AND APPLIED STATISTICS IN SPORT SCIENCE	3
- - -	EDU 901 or HSS 563	INQUIRY, THEORY, AND QUALITATIVE RESEARCH (EDU 901) ADVANCED STATISTICS IN SPORT SCIENCE (HSS 563)	3
Educational Component (select two courses from)			
EDT	500	MODELS OF TEACHING	3
HSS	540	INSTRUCTIONAL STRATEGIES	3

HSS 548	SAFETY AND LAW IN THE SPORT SCIENCES	3
HSS 556	ISSUES IN SPORT SCIENCE (SEMINAR)	2

Area of Concentration: Exercise Science		15
HSS 531	NUTRITION FOR EXERCISE/SPORT	3
HSS 535	EXERCISE ECG	3
HSS 537	BIOMECHANICS	3
HSS 550	PHYSIOLOGICAL RESPONSES TO EXERCISE	3
HSS 551	LABORATORY TECHNIQUES FOR THE SPORT SCIENCE PRACTITIONER	2
HSS 591	RESEARCH MANUSCRIPT	1 - 4
Other Elective		3

Courses **(Collapse All Courses)**

Code	Title	Sem. Hrs.
HSS 510	HISTORY OF SPORT AND PHYSICAL ACTIVITY	3

Study of the development of sport and physical education from early cultures to the present time. Emphasis on the United States.

HSS 518	STUDENT TEACHING	6

Course consists of teaching physical education under supervision in elementary, middle, or high school.

HSS 523	CURRICULUM DEVELOPMENT IN PHYSICAL EDUCATION	3

Principles and procedures for curriculum construction and revision; criteria for selecting activities and judging outcomes; the place of sport science within the total curriculum.

HSS 531	NUTRITION FOR EXERCISE/SPORT	3

Investigates the latest research trends in the nutritional assessment of the athlete. Topics will pertain to dietary needs, fluid replenishment, pre-game meals, and "fad" diets for the athlete.

HSS 535	EXERCISE ECG	3

Comprehensive coverage of the electrophysiology of the heart; the form-to-function relationship between the heart as an organ and the functioning of the intact human being in health, illness and aging; the mechanisms of selected anti-arrhythmic drugs and their ramifications for individuals at rest and exercise; the collection and interpretation of electrocardiography (ECG) tracings; and understanding the current literature relating to ECG topics and ability to design and complete an ECG study that includes pre and post tests and an exercise invention.

HSS 537	BIOMECHANICS	3

Investigations of physical principles operative in the performance of physical education activities with attempts to analyze for methods of greater effectiveness and improved performance.

HSS 540	INSTRUCTIONAL STRATEGIES	3

Contemporary research on teaching in physical education, sport instruction, and an in-depth study of Mosston's Spectrum of Teaching Styles serve as the primary foci of this course.

HSS 547	ADMINISTRATION OF INTERSCHOLASTIC AND INTRAMURAL ATHLETICS	2

Organization of high school athletic and intramural programs, staff, program, budget, health and safety, and other phases of administration.

HSS 548	SAFETY AND LAW IN THE SPORT SCIENCES	3

Study of basic safety measures to prevent injuries and avoid legal suits. Investigation of the fundamental principles involved in the legal aspects of sports in contemporary society. Analysis of specific court cases dealing with negligence in physical education and sport.

HSS 550 PHYSIOLOGICAL RESPONSES TO EXERCISE 3

A study of the physiological changes that occur during exercise and training.

HSS 551 LABORATORY TECHNIQUES FOR THE SPORT SCIENCE PRACTITIONER 2

The practical application of selected sport science tests and measurements. Emphasis will be placed on human performance (strength, cardiovascular, flexibility, and body composition) testing.

HSS 555 SURVEY OF RESEARCH PROCESSES AND DESIGN IN SPORT SCIENCE 3

This course is designed to develop an understanding of the nature of the general field of sport science research. It emphasizes the application of various research processes and design, learning by doing, and learning through example. Intended for use by individuals who have minimal knowledge of statistics.

HSS 556 ISSUES IN SPORT SCIENCE (SEMINAR) 2

A seminar to investigate and report on a specific issue in sport science.

HSS 560 EVALUATION AND APPLIED STATISTICS IN SPORT SCIENCE 3

Application of descriptive and inferential statistics to sport science tests and measurements. Quantitative analysis of selected physical fitness, motor performance, and body composition data.

HSS 561 ANALYSIS-SUPERVISION OF PHYSICAL EDUCATION 3

The use of systematic observation methodology in supervision and the study of both classic and contemporary research on the analysis of physical education and sport instruction serve as the primary foci of this course.

HSS 563 ADVANCED STATISTICS IN SPORT SCIENCE 3

The theory and hands-on applications of various social science statistical analyses to include: independent and dependent groups t-test, analysis of variance and covariance, multiple regression and non-parametric analyses. Students will use selected statistical software packages to execute real-world analyses problems.

HSS 575 INDIVIDUAL STUDIES IN SPORT SCIENCE 1 - 6

Individual investigations of a problem in sport science. Students may not register for HSS 575 without having completed HSS 555 and HSS 560.

HSS 582 INTERNSHIP IN SPORT SCIENCE 1 - 3

A job-related experience under the immediate supervision of personnel from a local sport science agency.

HSS 591 RESEARCH MANUSCRIPT 1 - 4

The development, planning, execution, analysis and manuscript completion of a research thesis in the sport sciences. The specific research question will be the student's choice with concurrence from his/her project advisor. Submission of the written product to a peer-reviewed research journal of at least national distribution is required before graduation. Students will also complete a successful oral defense of the thesis before the predesignated thesis team of at least three graduate faculty members from the School of Education & Allied Professions, two of which are from the Department of Health & Sport Science.

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School of Engineering

(MSC) Management Science (Collapse Description)

Patrick J. Sweeney, Chairperson of the Department of Engineering Management & Systems

The program of study leading to the Master of Science in management science is an interdisciplinary program administered by the School of Engineering, with the cooperative support of the College of Arts and Sciences, the School of Business Administration, and the School of Education and Allied Professions. Applications are invited from college graduates in all fields of study - business, education, engineering, liberal arts, physical sciences, and social sciences. The applicant whose preparation does not include at least three semesters of analytic geometry and calculus and computer competency will be expected to complete appropriate prerequisite courses prior to admission to the program. Check us out at http://engineering.udayton.edu /programs/management

The management scientist is the manager or staff specialist who is trained in the quantitative methodologies of operations research, systems analysis, and the decision sciences. These graduates are proficient in problem solving and decision-making, system modeling and optimization and the application of probability and statistical theory to management problems. Our graduates must also be familiar with a variety of other topics, such as quality control, inventory planning and control, reliability and maintainability, and system simulation.

The objective of this program is to develop quantitative management skills and capabilities appropriate to each student's needs and objectives. The program emphasizes the practical application of management science techniques in our modern society.

You do not have to interrupt your career to earn a master's degree in engineering management or management science. For the convenience of our students, courses are offered:

- on campus. Traditional on-campus classes once per week - usually in late afternoon or early morning.
- on site. Given sufficient enrollement, classes maybe offered at employer work sites.
- through distance learning. Courses are offered live to off campus locations - primarily work sites.

Master of Science in Management Science (MSC)
The program of study must include a minimum of 36 semester hours consisting of the following:

1. Eighteen semester hours of core courses in management science. These courses should provide depth in both deterministic and stochastic methods and will normally include: ENM 500, ENM 501, MSC 521, MSC 522, MSC 535, and MSC 572.

2. Nine semester hours of supporting electives approved by the advisor, to include at least one course from each of the Group 1 and Group 2 electives listed below.

- Group 1 MSC Electives (select at least one): MSC 544, MSC 546, ENM 560, ENM 561, ENM 562, or ENM 565.

- Group 2 MSC Electives (select at least one): MSC 523, MSC 526, MSC 527, ENM 541, MSC 542, or MSC 555.

3. Nine semester hours in a cognate field-or additional in-depth MSC courses-appropriate to the student's objectives, as approved by the advisor. Approved fields of study for the cognate field include applied mathematics, artificial intelligence, business administration, computer science, educational

administration, engineering, human factors, and manufacturing.

See also Master's Degree Requirements in section X, School of Engineering, in General Information. For additional information consult with the department chairperson and visit the department web site (http://engineering.udayton.edu/programs/management/.

The supporting and engineering electives within the program of study allows concentrations in areas appropriate to the student's objectives, such as reliability engineering, six sigma quality, software engineering, systems engineering, manufacturing, artificial intelligence, operations research, and simulation.

Programs

Program Name

Master of Science in Management Science (MSC)

The program of study must include a minimum of 36 semester hours consisting of the following:

1. Eighteen semester hours of courses in management science. These courses should provide depth in both deterministic and stochastic methods and will normally include MSC 521, 522, 535, 555 or 572, and two MSC courses from the selected management science specialization list.
2. Nine semester hours in a cognate field appropriate to the student's objectives, as approved by the advisor. Approved fields of study for the cognate field include applied mathematics, artificial intelligence, business administration, computer science, educational administration, engineering, human factors, manufacturing, public administration, or additional in-depth MSC courses.
3. Nine semester hours of supporting electives approved by the advisor, to include MSC 500 and MSC 501 or equivalent courses. Students with documented and equivalent knowledge of the subjects may, with the approval of the advisor and the chair, substitute other electives for the MSC 500-501 requirement.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

The selected management science specialization courses are: MSC 523, 541, 542, 555, 556, 560, 561, 565, 566 or 572. (MSC 555 or 572 may be taken as specialized electives only if not used to satisfy the core course requirements.)

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
MSC 521	INTRODUCTION TO OPERATIONS RESEARCH	3

This course covers mothods, principles and fundamentals of deterministic and stochastic operations research. Emphasis is on the formulation and solution of mathematical models in decision making environments, the search for optimal solutions to these decisions, and the explicit treatment of uncertainty through the use of probablisitic modeling and statistical analysis. Models include linear and non linear programs, inventory and production models, decision analysis, forecasting. and queing.
Prerequisite(s): ENM 500 or equivalent.

MSC 522	TOPICS IN OPERATIONS RESEARCH	3

In depth study if the methods, principles and fundamentals of operations research, designed to provide additional depth and breadth in selected OR subject areas. The selection of topics is based upon their usefulness in solving real world problems and their capacbility to enhance the student's

model building and model solving skills. This course will further enale the student to pursue studies in operations research through the elective program, self-study, and review of the published OR literature.
Prerequisite(s): MSC 521 or equivalent.

MSC 523 NONLINEAR OPTIMIZATION 3

This course concentrates on methods and engineering/management science applications of nonlinear optimization. Both single- and multi-variable methods as well as unconstrained and constrained problems are addressed. The course blends theoretical results such as the Kuhn-Tucker conditions and numerical search techniques such as conjugate directions with applications.

MSC 526 LINEAR AND INTEGER OPTIMIZATION 3

This course covers advanced topics in linear and integer programming with application to real-world problems. Topics include the revised simplex method, the dual-simplex method, interior point algorithms, duality and sensitivity analysis, decomposition principle, and goal and integer programming.
Prerequisite(s): MSC 521 or equivalent.

MSC 527 ADVANCED TOPICS IN OPTIMIZATION 3

This course emphasizes advanced topics in nonlinear or linear optimization with application to the solution of real-world problems. Topics reflect the state of the art in mathematical programming and optimization.
Prerequisite(s): MSC 521; permission of instructor.

MSC 535 APPLIED OPERATIONS RESEARCH/MANAGEMENT SCIENCE 3

This is a capstone course focused on the "art" rather than the "science" of problem solving in management science and operations research. Emphasis is placed on the techniques of problem solving and model building, examination of unique problem cases, and a course project requiring modeling, data collection, and analysis.
Prerequisite(s): Completion of the management science core courses or equivalent.

MSC 542 INVENTORY THEORY AND APPLICATION 3

In-depth coverage of inventory theory including both deterministic and stochastic models. Topics include EOQ models, quantity discounting, constrained inventory, the fixed reorder point model, the fixed review model, repairable inventory systems, and dynamic inventory/production models. Also discussed are system backorder and availability models. Both public and private sector applications are covered.
Prerequisite(s): (MSC 501 or 521) or equivalent.

MSC 544 FORECASTING AND TIME SERIES ANALYSIS 3

Concentration on statistical techniques for modeling and predicting discrete time-series phenomena, with emphasis on understanding and applying forecasting tools in analysis and management settings. Both classical smoothing methods and the Box-Jenkins methodology for model identification, estimation, and prediction are presented.
Prerequisite(s): MSC 500 or equivalent.

MSC 546 QUEUING THEORY AND APPLICATION 3

Emphasis on application of queuing theory to engineering problems. Machine interference, mathematical queuing models, marketing models, servicing problems, Monte Carlo techniques, and computer simulation models are covered.
Prerequisite(s): MSC 521 or equivalent.

MSC 555 SYSTEM DYNAMICS I 3

Introduction to the methodology for modeling the dynamics of complex engineering, business, and socioeconomic systems. These models are used to study the effect of organizational policies and design in higher-order, multiple-loop, nonlinear feedback systems.

MSC 556 SYSTEM DYNAMICS II 3

Continuation of MSC 555 with emphasis on the study of large-scale corporate, urban, educational, and ecological systems.
Prerequisite(s): MSC 555 or equivalent.

MSC 572 SYSTEM SIMULATION 3

An introduction to stochastic simulation. Topics covered include the generation of random numbers and random variables; analysis of input data; computer modeling of real systems; strategies, tactics, and experimentation involved in performing a simulation study; and the statistical analysis of simulation output.
Prerequisite(s): ENM 500 or equivalent.

MSC 575 INTRODUCTION TO ARTIFICIAL INTELLIGENCE 3

Introduction to the methods of artificial intelligence with an emphasis on engineering design and analysis. Topics include logical and probabilistic reasoning, pattern matching, knowledge representation, search, rule-based systems, natural language processing, and computer vision. Concepts and applications are illustrated with Lisp programs.

MSC 577 INTRODUCTION TO EXPERT SYSTEMS 3

Introduction to the development and application of rule-based systems using an integrated environment of commands, rules, databases, spreadsheets, text processing, and forms. Topics include knowledge representation, inference, search, ID3 algorithm, and logic along with suitable applications and their subsequent implementations.

MSC 579 SELECTED TOPICS IN ARTIFICIAL INTELLIGENCE 3

Special topics include engineering applications using neural net architecture, object-oriented programming, genetic algorithm and advanced search methods illustrated in Common Lisp and a rule-based environment.
Prerequisite(s): (MSC 575, 577) or permission of instructor.

MSC 595 CURRENT PROBLEMS 3

Topics of current interest in specialized areas of Management Science.

MSC 599 THESIS 1 - 6

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School of Engineering

(MAT) Materials Engineering (Collapse Description)

Daniel Eylon, Director of the Program

Programs (Collapse All)

Program Name

Doctorate of Engineering in Materials Engineering (MAT)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Doctorate of Philosophy in Materials Engineering (MAT)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Master of Science in Materials Engineering (MAT)

The program of study leading to the Master of Science in materials engineering must include a minimum of 30 semester hours consisting of the following:

1. Twelve semester hours in the major field.
2. Twelve semester hours of approved electives from current course offerings which best suit the student's requirements.
3. Six semester hours of research on a materials engineering project or thesis. Upon the request of the student and with the approval of the advisor and the program director, this may be replaced by six semester hours of additional coursework.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the advisor.

Explore by Department:

Geology
Health and Sport Science
Management Science
Materials Engineering

Explore

Explore by Program:

Literacy (MSE.ERE) (EDT)
Management Science (MSC)
Master of Mathematics Education (MME)
Materials Engineering (MAT)

Explore

Explore by Courses:

Geology (GEO)
Health and Sport Science (HSS)
Management Science (MSC)
Materials Engineering (MAT)

Explore

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
MAT 501	PRINCIPLES OF MATERIALS I	3

Structure of engineering materials from electronic to atomic and crystallographic considerations. Includes: atomic structure and interatomic bonding, imperfections, diffusion, mechanical properties, strengthening mechanisms, failure, phase diagrams, phase transformations and processing.
Prerequisite(s): MTH 219; college chemistry; college physics.

MAT 502	PRINCIPLES OF MATERIALS II	3

Structure, behavior, and processing of metal alloys, ceramics, polymers, and composites to include: mechanical behavior, corrosion, electrical, magnetic, and optical properties.
Prerequisite(s): MAT 501 or equivalent.

MAT 504	TECHNIQUES OF MATERIALS ANALYSIS	3

Fundamentals and applications of the traditional analytical methods such as x-ray analysis, electron microprobe, and scanning microscopy. Techniques such as NMR, atomic absorption, Raman, Mossbauer, and field ion microscopy will be covered. Emphasis on applicability.
Prerequisite(s): MAT 501 or permission of instructor.

MAT 506 MECHANICAL BEHAVIOR OF MATERIALS 3

Fudamental relationships between the structure and mechanical behavior of materials. Includes fudamentals of stress and strain, the physical basis for elastic deformation, elementary, dislocation theory and plastic deformation, strengthening mechanisms, yield criteria and their application to biaxial and multi-axial behavior and failure, fracture and toughening mechanisms, creep and creep rupture, behavior and failure of cellular solids, and fatigue.
Prerequisite(s): (MAT 501, 502) or permission of instructor.

MAT 507 INTRODUCTION TO CERAMIC MATERIALS 3

The fundamentals associated with modern ceramic technology are reviewed. Ceramic systems and processing technologies are presented. The properties of ceramics and the associated methods for measuring these properties are studied. The final phase of the course reviews the concepts for designing with ceramic materials and the range of applications for modern ceramics.
Prerequisite(s): MAT 501.

MAT 508 PRINCIPLES OF MATERIAL SELECTION 3

Basic scientific and practical consideration involved in the intelligent selection of materials for specific applications. Impact of new developments in materials technology and analytical techniques.
Prerequisite(s): MAT 501 or permission of instructor.

MAT 509 INTRODUCTION TO POLYMER SCIENCE - THERMOPLASTICS 3

Broad technical overview of the nature of synthetic macromoleecules, including the formation of ploymers and their structure, structure-property relationships, polymer characterization and processing, and applications of polymers. Fundamental topics such as viscoelasticity, the glassy state, time-temperature superposition, polymer transitions, and free volume will also be reviewed. The course focuses on thermoplastic polymers.
Prerequisite(s): Organic chemistry; college physics; differential equations.

MAT 510 HIGH PERFORMANCE THERMOSTAT POLYMERS 3

Survey of high performance thermoset resins, focusing on chemistry, processing, and properties of six general resin families: vinyl ester, epoxy, phenolic, cyanate ester, bismaleimide, and polyimides. The course will include fundamental discussions of polymerization mechanisms, network structure development, rheology and time-temperature transformation, resin toughening, and structure-processing-property relationships. Characterization techniques will also be reviewed.
Prerequisite(s): Organic chemistry; college physics; differential equations.

MAT 511 PRINCIPLES OF CORROSION 3

Theoretical and practical application of electrochemical principles to the field of corrosion covering thermodynamics, kinetics, forms of corrosion and methods for characterizing corrosion in areas of biomedial engineering, aerospace, automotive, and marine environments.
Prerequisite(s): MAT 501.

MAT 512 ENGINEERING MAGNETIC MATERIALS 3

Basics of magnetics, covering magnetic phenomena, spontaneous magnetization, and technical magnetization, will be introduced and technically important soft magnetic materials and permanent magnet materials will be described. Recent advances in magnetic materials, including magnetic materials with nanostructure, high-temperature magnetic materials, and giant magnetoresistance materials, will be emphasized.
Prerequisite(s): (MAT 501; college physics) or permission of instructor.

MAT 513 ADVANCED MAGNETIC MATERIALS 3

A more detailed description of magnetics and magnetic materials, including spontaneous magnetization, domain structure, magnetic anisotropy, energies involved in magnetic materials, technical magnetization, Fe, Fe-Si, Fe-Ni, Fe-Co, Fe-Al, soft ferrites, amorphous soft magnetic materials, nanocrystalline soft magnetic materials, Alnico, Fe-Cr-Co, hard ferrites, SmCo5, Sm2Co17, Nd2Fe14B, Sm-Fe-N, nanocomposite permanent magnet materials and coercivity mechanisms.
Prerequisite(s): MAT 512.

MAT 520 POWDER METALLURGY 3

Detailed treatment of scientific principles behind rapid solidification processing, powder production methods: metal and ceramic powders, powder analysis and powder consolidation, principles of mechanical alloying, processing methods and steps involved in producing P/M product forms, implications of powder metallurgy microstructures on mechanical behavior.
Prerequisite(s): MAT 501.

MAT 521 NONDESTRUCTIVE EVALUATION 3

Introduction to theory and application of methods for nondestructive flaw detection and materials characterization for metals, polymers, ceramics and advanced composites using x-ray, ultrasonic, electromagnetic (magnetic particle, eddy current), thermal, and optical techniques Also, statistical analysis of reliability, probability of detection and quality assurance provided.
Prerequisite(s): Permission of instructor.

MAT 527 METHODS OF POLYMER ANALYSIS 3

Modern laboratory techniques used in preparation and characterization of polymers; experimental investigations of polymer structure-property relations; measurement of molecular weight averages and distributions, thermal and mechanical properties, viscoelastic properties; transitions and crystallinity.
Prerequisite(s): MAT 509, 510.

MAT 535 HIGH-TEMPERATURE MATERIALS 3

This course will provide students with the basic material behavior concepts which control high-temperature properties of metals and alloys. A special emphasis will be given to creep behavior of metals and alloys including a comprehensive study of relationships between microstructure and high-temperature creep deformation of pure metals, single-phase alloys, multi-phase alloys, and dispersion-strengthened materials. In addition, the properties and applications of high-temperature materials will be discussed, especially those alloys used in the aerospace industry for gas turbine engine rotating-component, such as titanium and nickel-based superalloys.
Prerequisite(s): MAT 501 or equivalent.

MAT 539 THEORY OF PLASTICITY 3

Fundamentals of plasticity theory including elastic, viscoelastic, and elastic-plastic constitutive models: plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures.
Prerequisite(s): EGM 503 or 533.

MAT 540 COMPOSITE DESIGN 3

Design with composite materials. Micromechanics. Lamination theory. Joining. Fatigue. Environmental effects.
Prerequisite(s): EGM 303 or 330.

MAT 541 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3

Introduction to the mechanical response of fiber-reinforced composite materials with emphasis on the development of experimental methodology. Analytical topics include stress-strain behavior of anisotropic materials, laminate mechanics, and strength analysis. Theoretical models are applied to the analysis of experimental techniques used for characterizing composite materials. Lectures are supplemented by laboratory sessions in which characterization tests are performed on contemporary composite materials.
Prerequisite(s): EGM 303 or 330.

MAT 542 ADVANCED COMPOSITES 3

Materials and processing. Comprehensive introduction to advanced fiber reinforced polymeric matrix composites. Constituent materials and composite processing will be emphasized with special emphasis placed on structure-property relationships, the role of matrix in composite processing, mechanical behavior and laminate processing. Specific topics will include starting materials, material forms, processing, quality assurance, test methods, and mechanical behavior.
Prerequisite(s): (MAT 501 or 509) or permission of instructor.

MAT 543 ANALYTICAL MECHANICS OF COMPOSITE MATERIALS 3

Analytical models are developed for predicting the mechanical and thermal behavior of fiber-reinforced composite materials as a function of constituent material properties. Both continuous and discontinuous fiber-reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micro-mechanics and lamination theory, free-edge effects, and failure criteria.
Prerequisite(s): EGM 303 or 330.

MAT 544 MECHANICS OF COMPOSITE STRUCTURES 3

Comprehensive treatment of laminated beams, plates, and sandwich structures. Effect of heterogeneity and anisotropy on bending under lateral loads, buckling, and free vibration are emphasized. Shear deformation and other higher-order theories and their range of parametric applications also considered.
Prerequisite(s): MAT 543 or permission of instructor.

MAT 550 MATERIALS ENGINEERING PROJECT 1 - 6

Student participation in a materials engineering project under the direction of a project advisor. The student prepares a satisfactory written report, as determined by the project advisor, and presents an open seminar on the subject of the project.

MAT 570 FRACTURE MECHANICS 3

Application of the principles of fracture mechanics to problems associated with fatigue and fracture in engineering structures. The course will cover the development of models that apply to a range of materials, geometries, and loading conditions.
Prerequisite(s): MAT 506 or permission of instructor.

MAT 575 FRACTURE AND FATIGUE OF METALS AND ALLOYS I 3

This course will cover the effects of microstructure on the fracture and fatigue behavior of engineering metals and alloys with a special emphasis on static and dynamic brittle and ductile failures and static and fatigue crack initiation. Alloy fracture resistance, fracture toughness, fatigue behavior, and methods to improve fracture and fatigue behavior will be discussed in detail. Various analytical techniques for failure analysis of structural components will be presented. A practical failure-analysis project will be performed.
Prerequisite(s): (MAT 501 or 506) or permission of instructor.

MAT 576 FRACTURE AND FATIGUE OF METALS AND ALLOYS II 3

This course will cover the areas of the effects of microstructure on fatigue crack propagation and on final fracture by fatigue. This will include fatigue life prediction, using damage-tolerance approach to component-design and microstructural and structural synthesis for optimum behavior. Specific material-related aspects of fatigue crack propagation mechanisms for optimum damage tolerant behavior, and the related failure analysis will also be covered. A comprehensive project in failure-analysis of aerospace metallic components will also be conducted.
Prerequisite(s): MAT 575 or equivalent.

MAT 577 LIGHT STRUCTURAL METALS 3

This course is an introduction and review of light structural metals, commonly used throughout the aerospace and automotive industries. It will include the mtallurgy of light metals, from ore extraction, smelting, alloying and shape making to heat-treatment. Design and applications of light structural metals and a comprehensive technology and economic comparisons with other groups of metals wil be presented.
Prerequisite(s): MAT 501, 502.

MAT 589 GRADUATE SEMINAR SERIES 1

Graduate seminars on various current material topics presented by guest speakers.

MAT 590 SELECTED READINGS IN MATERIALS ENGINEERING 1 - 3

Directed readings in selected areas of materials engineering arranged and approved by the student's advisor and the program director.

MAT 595 SPECIAL PROBLEMS IN MATERIALS ENGINEERING 1 - 3

Special assignments arranged by the materials engineering faculty.

MAT 599 THESIS 1 - 6

MAT 601 SURFACE CHEMISTRY OF SOLIDS 3

The nature of solid surfaces as determined by the techniques of x-ray photoelectron and Auger electron spectroscopy, secondary ion mass spectrometry, and ion scattering spectroscopy.
Prerequisite(s): MAT 501 or permission of instructor.

MAT 602 ELECTRONIC PROPERTIES OF MATERIALS 3

An introduction to quantum mechanics, the electronic properties of isolated atoms, and the evolution of these properties in the formation of condensed matter. Topics covered include an introduction to quantum mechanics, the hydrogen atom, the periodic table, free electron theory of metals, band theory of solids, semiconductors, dielectric materials, magnetic materials, lasers, and optoelectronics.
Prerequisite(s): College physics; calculus; differential equations.

MAT 603 MATERIALS SCIENCE OF THIN FILMS 3

An introduction to the basic physics of film formation processes including physical vapor deposition and chemical vapor deposition, film properties, and applications. Nucleation theory, film interdiffusion and reaction, metallurgical and protective coatings, electrical, magnetic, and optical properties of thin films. Emphasis on applicability.
Prerequisite(s): College physics; fundamental physical and chemical properties of materials.

MAT 604 NANOSTRUCTURED MATERIALS 3

A graduate-level course covering the fundamental physics, properties, and applications of nanostructured materials. Includes carbon nanotubes, nanostructured ceramics, metals, and semiconductor materials.
Prerequisite(s): College physics; fundamental physical and chemical properties of materials.

MAT 605 INTRODUCTION TO CARBON NANOTHECNOLOGY 3

A graduate-level course covering the fundamental and applied aspects of Carbon Nanoscale Science and Technology. The course has three goals: (1) an overview of the current development in carbon science and technology (2) an introduction to the surface science as a means to understand the surface interaction at molecular scale, and (3) to provide some explicit links between macro, micro, and nano scale technologies. Some of the medical field, structural and friction application will be addressed. This course is aimed at both science and engineering students.

MAT 690 SELECTED READINGS IN MATERIALS ENGINEERING 1 - 3

Directed readings in materials engineering area arranged and approved by the chair of the student's advisory committee and the program director. May be repeated.

MAT 695 SPECIAL PROBLEMS IN MATERIALS ENGINEERING 1 - 3

Special assignments in materials engineering subject matter arranged and approved by the student's doctoral advisory committee and the program director. May be repeated.

MAT 698 D.E. DISSERTATION 1 - 15

An original investigation as applied to materials engineering practice. Results must be of sufficient importance to merit publication.

MAT 699 Ph.D. DISSERTATION 1 - 15

An original research effort which makes a definite contribution to technical knowledge. Results must be of sufficient importance to merit publication.

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the Bulletin
AUGUST 2006 - GRADUATE ISSUE
→ Explore a Different Issue

College of Arts and Sciences

(MTH) Mathematics (Collapse Description)

Paul W. Eloe, Chair of the Department, MFM Co-Director
Muhammad N. Islam, MAS Graduate Program Director, MFM Co-Director
Rebecca J. Krakowski, MME Program Director

The Department of Mathematics offers three masters degrees, the Master of Science in Applied Mathematics (MAS), the Master of Financial Mathematics (MFM) and the Master of Mathematics Education (MME).

Applied Mathematics

The MAS program is interdisciplinary in nature. A plan of study may include up to a four-course concentration in computer science, engineering, or business for students with appropriate backgrounds. The primary objective of the program in applied mathematics is to train students to do professional work in the applications of mathematics. The program provides a background in mathematical, numerical, and statistical analyses and students will gain valuable experience in modeling and computation. Students will have the opportunity to work on a semester or year-long project known as the Mathematics Clinic project.

The program strives to offer an individualized plan of study that meets the needs and career goals of the student. This is achieved by offering a core of courses blending analysis, linear algebra, modeling, and numerical analysis in the Department of Mathematics. The student, with departmental approval, will select a four-course concentration. The Mathematics Clinic project, the capstone requirement, is a research project in which the student applies mathematical, numerical, or statistical modeling methods to a problem related to the student's four-course concentration. The Mathematics Clinic project can be a team project and can involve faculty members from several departments.

An individualized degree program consists of courses satisfying the five core areas, an area of concentration, and electives. The program is approved by the student's committee and program director, and is intended to satisfy the specific needs and interests of the individual. Any core course that is already part of the student's academic background may be replaced with an elective consistent with the other requirements of the program.

To satisfy the requirement of an area of concentration, a student will be required to take 12 semester hours of 500-level coursework in the selected area of concentration. Examples of areas of concentration include (but are not limited to):

Differential Systems. Advanced and Partial Differential Equations (MTH 531 and MTH 535) plus six additional hours of mathematics courses approved by the committee.
Engineering Systems. Continuum Mechanics and Theory of Elasticity (EGM 503 and EGM 533) plus six additional hours of engineering courses (of a mathematical nature) approved by the committee.
Computational Systems. Numerical Analysis (MTH 555 and MTH 556) plus six additional hours of computer science courses approved by the committee.

Financial Mathematics

The MFM is a professional program in quantitative methods in finance to support a growing local and regional market in financial services. It is offered in cooperation with the Department of Economics and Finance. The program integrates statistics, computation and modeling with training in the professional domain and graduates will find employment opportunities in the banking, insurance and financial trading industries. A plan of study includes six core courses that include coursework in the MBA program, and four electives courses, selected, in consultation with a faculty advisor, from a broad set of electives from Mathematics, MBA, Management Science and Computer Science. There are two introductory courses, one in partial differential equations and one in principles of finance; one or both of these courses can be waived

for students with appropriate background in mathematics or finance.

As with the MAS program, the MFM program requires a capstone experience of a Mathematics Clinic project. Teams of students will report to a faculty member and work on a project that is posed by the financial industry.

Students continue their training in the professional domain with the completion of five Workshops on Topics in Business.

Mathematics Education

The MME program has been developed to meet the professional needs of high school mathematics teachers. Ohio Department of Education licensure guidelines now require that all K-12 grade teachers complete a master's degree program in their content area or general education in order to maintain a provisional teaching license for a second renewal. The Department of Mathematics has created the MME to meet this requirement, and has been designed to address issues that are especially important to high school mathematics educators.

Key features of the MME include: curriculum that focuses on pedagogical content knowledge - the special knowledge that distinguishes the mathematics knowledge of teachers from that of mathematicians; student development of a stronger mathematics content knowledge, as well as the ability and opportunity to apply this knowledge to the 9-12 grade curriculum; introduction to major research issues and both quantitative and qualitative methods in mathematics education; students' continued growth as leaders in education; an emphasis on the latest technological advances - both computer-based and using hand-held graphing utilities; students will consistently experience "best practices" as modeled by program faculty whose area of expertise is mathematics education.

This is primarily a summer program that offers a solid base in the teaching of secondary school mathematics. The curriculum includes both mathematics and education coursework consisting of 10 classses, three graduate semester credit hours each, that may be completed over the course of three summers, with minimal requirements during the regular school year.

As is the case with other graduate programs within the Department of Mathematics, the MME program requires a capstone experience of a Mathematics Clinic project. Each student will work with a faculty member to design and implement an action research project in mathematics education. A "journal ready" report will be required, as well as a presentation of their findings in one of our departmental colloquia.

Assistantships

Financial assistance is available to qualified students through graduate teaching assistantships. A graduate assistant receives a stipend, tuition remission, and health benefits. Most graduate assistants require two years to complete the requirements for a master's degree. Internships in the MFM program are recommended and the Department facilitates finding internship opportunities.

Facilities

Departmental PCs and the MATHSCI Computer Learning Environment are available for student use in conjunction with projects or coursework.

Programs (Collapse All)

Program Name

Master of Financial Mathematics (MFM)

		Sem. Hrs.
Financial Mathematics		**33**
MBA 620[1]	FINANCIAL ANALYSIS AND MARKETS	3
MBA 622	ADVANCED CORPORATE FINANCE	3
MBA 623	COMPUTATIONAL FINANCE	3
MTH 528	STOCHASTIC PROCESSES	3
MTH 535[2]	PARTIAL DIFFERENTIAL EQUATIONS	3
MTH 538	INTRODUCTION TO FINANCIAL MATHEMATICS	3
MTH 541	MATHEMATICS CLINIC	3
MTH 544	TIME SERIES	3
MTH 556	NUMERICAL ANALYSIS II	3
MBA 628	FIXED INCOME ANALYSIS	3

Electives (select four from the following)[3,4]

CPS 542	DATABASE MANAGEMENT SYSTEMS	3
CPS 562	DATABASE MANAGEMENT SYSTEMS II	3
MBA 625	INVESTMENTS AND FINANCIAL MARKETS	3
MBA 628	FIXED INCOME ANALYSIS	3
MTH 531	ADVANCED DIFFERENTIAL EQUATIONS	3
MTH 532	DIFFERENCE EQUATIONS AND APPLICATIONS	3
MTH 535	PARTIAL DIFFERENTIAL EQUATIONS	3
MTH 543	LINEAR MODELS	3
MTH 547	STATISTICS FOR EXPERIMENTERS	3
MTH 551	METHODS OF MATHEMATICAL PHYSICS	3
MTH 552	METHODS OF APPLIED MATHEMATICS	3
MTH 565	LINEAR ALGEBRA	3
MTH 583	DISCRETE AND CONTINUOUS FOURIER ANALYSIS	3

[1]This is a required introductory finance-related course. It can be waived for students with sufficient background.

[2]This is a required introductory mathematics course. It can be waived for students with sufficient background.

[3]ECO 441 and FIN 480 can be taken for graduate credit.

[4]Three hours earned in either MBA 620 or MTH 535 can be counted toward the minimum of twelve semester hours of electives.

Master of Science in Applied Mathematics (MAS)

		Sem. Hrs.
Applied Mathematics		**33**
MTH 404 or 525	COMPLEX VARIABLES (MTH 404) COMPLEX VARIABLES I (MTH 525)	3
MTH 430	REAL ANALYSIS	3
MTH 531 or 535	ADVANCED DIFFERENTIAL EQUATIONS (MTH 531) PARTIAL DIFFERENTIAL EQUATIONS (MTH 535)	3
MTH 541	MATHEMATICS CLINIC	3
MTH 555 or 556	NUMERICAL ANALYSIS I (MTH 555) NUMERICAL ANALYSIS II (MTH 556)	3
MTH 565	LINEAR ALGEBRA	3
Mathematics Electives (see below)		15

Electives[1]

MTH 519	STATISTICAL INFERENCE	3
MTH 520	STATISTICAL INFERENCE	3
MTH 521	REAL VARIABLES	3
MTH 522	REAL VARIABLES	3
MTH 525	COMPLEX VARIABLES I	3
MTH 526	COMPLEX VARIABLES II	3
MTH 532	DIFFERENCE EQUATIONS AND APPLICATIONS	3
MTH 540	MATHEMATICAL MODELING	3
MTH 541	MATHEMATICS CLINIC	3
MTH 543	LINEAR MODELS	3
MTH 545	SPECIAL FUNCTIONS	3
MTH 547	STATISTICS FOR EXPERIMENTERS	3
MTH 551	METHODS OF MATHEMATICAL PHYSICS	3
MTH 552	METHODS OF APPLIED MATHEMATICS	3
MTH 561	MODERN ALGEBRA I	3
MTH 562	MODERN ALGEBRA II	3
MTH 571	TOPOLOGY I	3
MTH 572	TOPOLOGY II	3
MTH 573	FUNCTIONAL ANALYSIS	3
MTH 575	DIFFERENTIAL GEOMETRY	3
MTH 582	VECTOR AND TENSOR ANALYSIS	3

MTH 583	DISCRETE AND CONTINUOUS FOURIER ANALYSIS	3
MTH 590	TOPICS IN MATHEMATICS	3

[1]At most, 6 hours of approved 400-level courses may be part of the student's program.

Master of Science in Mathematics Education (MME)

		Sem. Hrs.
Program Requirements		
EDT 500	MODELS OF TEACHING	3
EDT 502	PHILOSOPHICAL STUDIES IN EDUCATION	3
EDT 650	PROFESSIONAL DEVELOPMENT OF TEACHER LEADERS	3
MTH 512	GEOMETRY FOR SECONDARY TEACHERS	3
MTH 513	ALGEBRA FOR SECONDARY TEACHERS	3
MTH 514	ADVANCED MATHEMATICS FOR SECONDARY TEACHERS	3
MTH 515	APPLICATIONS OF GRAPH THEORY AND COMBINATORICS IN MODERN MATHEMATICS	3
MTH 516	APPLICATIONS OF LINEAR AND ABSTRACT ALGEBRA IN MODERN MATHEMATICS	3
MTH 517	RESEARCH METHODS AND ISSUES IN MATHEMATICS EDUCATION	3
MTH 541	MATHEMATICS CLINIC	3

Courses **(Collapse All Courses)**

Code Title Sem. Hrs.

MTH 404 COMPLEX VARIABLES 3

Functions of a complex variable, conformal mapping, integration in the complex plane. Laurent series and residue theory.
Prerequisite(s): MTH 219.

MTH 430 REAL ANALYSIS 3

Continuation of MTH 330. Topics include the theory of convergence of sequences and series of functions in the context of metric spaces, uniform continuity, uniform convergence, and integration.
Prerequisite(s): MTH 330.

MTH 512 GEOMETRY FOR SECONDARY TEACHERS 3

Investigation of traditional secondary school topics in Euclidean geometry, introduction to similar ideas in non-Euclidean spaces, examination of the impact of mathematics education research on the teaching and learning of geometry, and exploration of real-world applications. Extensive use of the dynamic software package The Geometer's Sketchpad® will also be incorporated into every aspect of the course. Topics to be explored may include transformations, symmetry, tessellations, centers of triangles (incenter, centroid, orthocenter, and circumcenter), similarity, coordinate geometry, and spherical or hyperbolic geometry.
Prerequisite(s): MTH 370 or permission of instructor.

MTH 513 ALGEBRA FOR SECONDARY TEACHERS 3

Investigation of traditional secondary school topics from introductory and advanced algebra courses, examination of appropriate use of manipulatives (e.g., algebra tiles) to explore algebraic concepts, integration of hand-held graphing technology and data collection devices in the study of algebra, and implications of research in mathematics education on the teaching and learning of algebra. Topics discussed in the course may include basic properties and mechanics of equations and functions, functions that model real-world phenomena, models for factoring polynomial expressions, and integration of physical science and mathematics.
Prerequisite(s): Permission of instructor.

MTH 514 ADVANCED MATHEMATICS FOR SECONDARY TEACHERS 3

Investigation of concepts related to trigonometry, analytic geometry, precalculus, and calculus; integration of appropriate uses of graphing technology and data collection devices to enhance students' understanding in their investigation of real-world examples; and implications of research in mathematics education on the teaching and learning of the concepts discussed in this course. A variety of topics that may be explored include: trigonometric functions and applications; rate of change in business, physics, and society; limits, continuity, and differentiability; and applications of area and volume.
Prerequisite(s): MTH 218 or permission of instructor.

MTH 515 APPLICATIONS OF GRAPH THEORY AND COMBINATORICS IN MODERN MATHEMATICS 3

An opportunity to study selected topics in graph theory and combinatorics in depth. Appropriate uses of computing technology will be included. Topics may include an introduction to circuits and graph coloring theorems, traveling salesperson problems, and sorting algorithms, problems, and methods in counting, networks, and finding winning strategies for Nim-type games.
Prerequisite(s): (MTH 367 or 411) or permission of instructor.

MTH 516 APPLICATIONS OF LINEAR AND ABSTRACT ALGEBRA IN MODERN MATHEMATICS 3

Study of topics connected to real-world applications in both linear and abstract algebra, and an introduction to matrix operations with EXCEL and TI graphing technology. Topics discussed may include: introductory coding theory and cryptography; symmetry groups in mathematics, science, engineering, architecture, and art; permutation groups; linear programming problems and the simplex method; and Markov chains.
Prerequisite(s): (MTH 302, 361) or permission of instructor.

MTH 517 RESEARCH METHODS AND ISSUES IN MATHEMATICS EDUCATION 3

Review of related literature and research in education and mathematics education, and a study of key concepts necessary to analyze, evaluate, and conduct educational research. Application of both qualitative and quantitative research methods specifically related to the development of a research proposal. The focus on quantitative research methods provides ample opportunities to review fundamental concepts and properties of both descriptive and inferential statistics. Introduction to SAS or SPSS, both statistical programming packages appropriate for use in educational research, will be included in the course.
Prerequisite(s): (MTH 367 or 412) or permission of instructor.

MTH 519 STATISTICAL INFERENCE 3

Sample spaces, Borel fields, random variables, distribution theory, characteristic functions, exponential families, minimax and Bayes' procedures, sufficiency, efficiency, Rao-Blackwell theorem, Neyman-Pearson lemma, uniformly most powerful tests, multi-variate normal distributions.

MTH 520 STATISTICAL INFERENCE 3

Sample spaces, Borel fields, random variables, distribution theory, characteristic functions, exponential families, minimax and Bayes' procedures, sufficiency, efficiency, Rao-Blackwell theorem, Neyman-Pearson lemma, uniformly most powerful tests, multi-variate normal distributions.

MTH 521 REAL VARIABLES 3

The topology of the real line, continuity and differentiability, Riemann and Stieltjes integrals, Lebesgue measure and Lebesgue integral. Measure and integration over abstract spaces, Lp-spaces, signed measures, Jordan-Hahn decomposition, Radon-Nikodym theorem, Riesz representation theorem, and Fourier series.

MTH 522 REAL VARIABLES 3

The topology of the real line, continuity and differentiability, Riemann and Stieltjes integrals, Lebesgue measure and Lebesgue integral. Measure and integration over abstract spaces, Lp-spaces, signed measures, Jordan-Hahn decomposition, Radon-Nikodym theorem, Riesz representation theorem, and Fourier series.

MTH 525 COMPLEX VARIABLES I 3

Analytic functions, integration on paths, the general Cauchy theorem. Singularities, residues, inverse functions and other applications of the Cauchy theory.

MTH 526 COMPLEX VARIABLES II 3

Infinite products, entire functions, the Riemann mapping theorem and other topics as time permits.
Prerequisite(s): MTH 525 or equivalent.

MTH 528 STOCHASTIC PROCESSES 3

The fundamental theory of stochastic processes. Topics to include general theory of stochastic processes, Markov chains, Poisson process, birth and death process, renewal processes, random walk and Brownian motion and Martingales. Applications will also be introduced.
Prerequisite(s): MTH 411 or equivalent.

MTH 531 ADVANCED DIFFERENTIAL EQUATIONS 3

Existence and uniqueness theorems, linear equations and systems, self-adjoin systems, boundary value problems and basic nonlinear techniques.
Prerequisite(s): MTH 403 or equivalent.

MTH 532 DIFFERENCE EQUATIONS AND APPLICATIONS 3

The calculus of finite differences, first order equations, linear equations and systems, z-transform, stability, boundary value problems for nonlinear equations, Green's function, control theory and applications.

MTH 535 PARTIAL DIFFERENTIAL EQUATIONS 3

Classification of partial differential equations; methods of solution for the wave equation, Laplace's equation, and the heat equation; applications.
Prerequisite(s): MTH 403 or equivalent.

MTH 538 INTRODUCTION TO FINANCIAL MATHEMATICS 3

Introduction to financial derivatives, review of probability theory, conditional expectation and martingale, random walk and Brownian motion, stochastic integral and Ito lemma, stochastic differential equations, stock price models, Black-Scholes PDEs, Girsanov Theorem and risk-neutral probability, stopping times and American options, and other selected topics.
Prerequisite(s): (MTH 535 or (background in differential equations; background in linear algebra)); twelve semester hours of calculus; background in probability.

MTH 540 MATHEMATICAL MODELING 3

An introduction to the use of mathematical techniques and results in constructing and modifying models designed to describe and/or predict behavior of real-world situations.
Prerequisite(s): Permission of instructor.

MTH 541 MATHEMATICS CLINIC 3

Student teams will be responsible for developing or modifying and testing a mathematical model designed for a particular purpose. Faculty guidance will be provided. May be repeated once for a maximum of 6 credit hours.
Prerequisite(s): Permission of department chairperson or program director.

MTH 543 LINEAR MODELS 3

Least square techniques, lack of fit and pure error, correlation, matrix methods, F test, weighted least squares, examination of residuals, multiple regression, transformations and dummy variables, model building, ridge regression, stepwise regression, multiple regression applied to analysis of variance problems.
Prerequisite(s): MTH 368 or equivalent.

MTH 544 TIME SERIES 3

Estimation and elimination of trend and seasonal components; stationary time series, autocovariance, autocorrelation and partial autocorrelation functions; spectral analysis; modeling and forecasting with ARMA processes; nonstationary and seasonal time series.
Prerequisite(s): Courses in single and multivariate calculus; courses in statistics and probability; courses in linear algebra.

MTH 545 SPECIAL FUNCTIONS 3

The special functions arising from solutions of boundary value problems which are encountered in engineering and the physical sciences. Hypergeometric functions, Bessel functions, Legendre polynomials.
Prerequisite(s): MTH 403 or equivalent.

MTH 547 STATISTICS FOR EXPERIMENTERS 3

Covers those areas of design of experiments and analysis of quantitive data that are useful to anyone engaged in experimental work. Designed experiments using replication and blocking. Use of transformations. Applications of full and fractional factorial designs. Experimental design for developing quality into products using Taguchi methods.
Prerequisite(s): MTH 367 or equivalent.

MTH 551 METHODS OF MATHEMATICAL PHYSICS 3

Linear transformations and matrix theory, linear integral equations, calculus of variations, eigenvalue problems.
Prerequisite(s): MTH 403 or equivalent.

MTH 552 METHODS OF APPLIED MATHEMATICS 3

Dimensional analysis and scaling, regular and singular perturbation methods with boundary layer analysis, the stability and bifurcation of equilibrium solutions, other asymptotic methods.
Prerequisite(s): MTH 403 or equivalent.

MTH 555 NUMERICAL ANALYSIS I 3

Solutions of nonlinear equations, Newton's methods, fixed point methods, solutions of linear equations, LU decomposition, iterative improvement, QR decomposition, SV decomposition.
Prerequisite(s): (CPS 132 or 150) or equivalent; MTH 302 or equivalent.

MTH 556 NUMERICAL ANALYSIS II 3

Interpolating functions, numerical differentiation, numerical integration including Gaussian quadrature, numerical solutions of differential equations.
Prerequisite(s): (CPS 132 or 150) or equivalent; MTH 219 or equivalent.

MTH 557 FINANCIAL DERIVATIVES & RISK MANAGEMENT 3

x

MTH 557 FINANICAL DERIVATIVES AND RISK MANAGEMENT 3

This course provides a theoretical foundation for the pricing of contingent claims and for designing risk-management strategies. It covers option pricing models, hedging techniques, and trading strategies. It also includes portfolio insurance, value-at-risk measure, multistep binomial trees to value American options, interest rate options, and other exotic options.
Prerequisite(s): MBA 620.

MTH 561 MODERN ALGEBRA I 3

Groups, rings, integral domains and fields; extensions of rings and fields; polynomial rings and factorization theory in integral domains; modules and ideals.

MTH 562 MODERN ALGEBRA II 3

Finite and infinite field extensions, algebraic closure, constructible numbers and solvability by use of radicals, Galois theory, and selected advanced topics.
Prerequisite(s): MTH 561.

MTH 563 COMPUTATIONAL FINANCE 3

The purpose of this course is to introduce students to numerical methods and various financial problems that include portfolio optimization and derivatives valuation that can be tackled by numerical methods. Students will learn the basics of numerical analysis, optimization methods, monte carlo simulations and finite difference methods for solving PDEs.
Prerequisite(s): MBA 620 or permission of instructor.

MTH 565 LINEAR ALGEBRA 3

Vector spaces, linear transformations and matrices; determinants, inner product spaces, invariant direct-sum decomposition and the Jordan canonical form.

MTH 571 TOPOLOGY I 3

An axiomatic treatment of the concept of a topological space; bases and subbases; connectedness, compactness; continuity, homeomorphisms, separation axioms and countability axioms; convergence in topological spaces.

MTH 572 TOPOLOGY II 3

Compactification theory, para-compactness and metrizability theorems, uniform spaces, function spaces, and other advanced topics of current interest.
Prerequisite(s): MTH 571 or equivalent.

MTH 573 FUNCTIONAL ANALYSIS 3

The study of linear metric spaces with emphasis on Banach and Hilbert spaces. The Hahn-Banach theorem, the Banach fixed point theorem, and their consequences. Approximations and other selected advanced topics.

MTH 575 DIFFERENTIAL GEOMETRY 3

Vector and tensor algebra; covariant differentiation. An introduction to the classical theory of curves and surfaces treated by means of vector and tensor analysis.

MTH 582 VECTOR AND TENSOR ANALYSIS 3

The differential and integral calculus of scalar and vector fields with emphasis on properties invariant under transformations to curvilinear coordinate systems. An introduction to tensor analysis via Cartesian tensors and then more general tensors. Derivation of the divergence, gradient, and curl in generalized coordinates.
Prerequisite(s): (MTH 218, 302) or equivalent.

MTH 583 DISCRETE AND CONTINUOUS FOURIER ANALYSIS 3

Fourier representations of complex-valued functions, rules for finding Fourier transforms, mathematical operators associated with Fourier analysis, fast algorithms, wavelet analysis, selected applications.
Prerequisite(s): MTH 302 or equivalent; (MTH 219 or 319) or equivalent.

MTH 590 TOPICS IN MATHEMATICS 3

This course, given upon appropriate occasions, deals with specialized material not covered in the regular courses. May be taken more than once as topics change.
Prerequisite(s): Permission of advisor.

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the Bulletin
AUGUST 2006 - GRADUATE ISSUE
Explore a Different Issue

School of Engineering

(MEE) Mechanical Engineering (Collapse Description)

Kevin Hallinan, Chair of the Department

Programs (Collapse All)

Program Name

Doctorate of Engineering in Mechanical Engineering (MEE)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Doctorate of Philosophy in Mechanical Engineering (MEE)

See Doctoral Degree Requirements in section X, School of Engineering in General Information and consult with the department chair.

Master of Science in Mechanical Engineering (MEE)

For the Master of Science in mechanical engineering, major areas of concentration are materials, thermo-fluids, solid mechanics, and design and manufacturing (practice oriented). Each program of study leading to this degree must include a minimum of 30 semester hours approved by the student's advisor, and consisting of the following:

1. Twelve semester hours in mechanical engineering courses to be selected from one of the following areas of concentration.

   Materials-MEE 501, 502, 503, 505, 506, 508, 509, 525, 541, 542, 543, 544, 570, 575, 576.

   Thermo-Fluids-MEE 503, 504, 505, 511, 512, 513, 514, 515, 516, 517, 540, 552, 553, 555, 565, 566, 567, 568, 569. AEE 501, 502, 556, 558.

   Solid Mechanics-MEE 503, 519, 533, 534, 535, 536, 538, 539, 543, 544, 545, 546, 547, 548, 549, 570, 575.

   Practice Oriented Design and Manufacturing-MEE 503, 506, 520, 521, 522, 523, 527, 533, 534, 535, 536, 537, 538, 539, 540, 545, 546, 547, 551, 570, 572, 574, 575, 577, 579, 582, 585, 587.

2. Six semester hours of research on a mechanical engineering project or thesis. Both a written document and an oral presentation are required. Upon the request of the student and with the approval of the advisor and department chair, this requirement may be replaced by six semester hours of additional coursework. A maximum of six semester hours may be taken in MEE 550, 590, 595, and 599 courses.
3. Three semester hours of mathematics approved by the student's advisor.
4. Up to nine semester hours of electives, to be chosen from current course offerings which best suit the student's requirements and approved by the student's advisor.

See also Master's Degree Requirements in section X, School of Engineering in General Information and consult with the advisor.

Explore by Department:

Management Science
Materials Engineering
Mathematics
Mechanical Engineering

Explore

Explore by Program:

Management Science (MSC)
Master of Mathematics Education (MME)
Materials Engineering (MAT)
Mechanical Engineering (MEE)

Explore

Explore by Courses:

Management Science (MSC)
Materials Engineering (MAT)
Mathematics (MTH)
Mechanical Engineering (MEE)

Explore

Courses **(Collapse All Courses)**

Code	Title	Sem. Hrs.

MEE 500 ADVANCED ENGINEERING ANALYSIS 3

Detailed analysis of engineering problems using laws of nature, fundamental engineering principles, mathematics, computers, and practical experience to construct, resolve, and test analytic models of physical events. Emphasis is on the use of the professional engineering approach which includes formulation of the problem, assumptions, plan or method of attack, solving the problem, checking and generalizing the results.

MEE 501 PRINCIPLES OF MATERIALS I 3

Structure of engineering materials from electronic to atomic and crystallographic considerations. Includes atomic structure and interatomic bonding, imperfections, diffusion, mechanical properties, strengthening mechanisms, failure, phase diagrams, phase transformations and processing.
Prerequisite(s): MTH 219; college chemistry; college physics.

MEE 502 PRINCIPLES OF MATERIALS II 3

Structure, behavior and processing of metal alloys, ceramics, polymers, and composites to include: mechanical behavior, corrosion, electrical, magnetic, and optical properties.
Prerequisite(s): MEE 501 or equivalent.

MEE 503 INTRODUCTION TO CONTINUUM MECHANICS 3

Tensors, calculus of variations, Lagrangian and Eulerian descriptions of motion. General equations of continuum mechanics, constitutive equations of mechanics, thermodynamics of continua. Specialization to cases of solid and fluid mechanics.
Prerequisite(s): EGM 303 or 330.

MEE 504 FUNDAMENTALS OF FLUID MECHANICS 3

An advanced course in fluid mechanics with emphasis on the derivation of conservation equations and the application of constitutive theory. Navier-Stokes equations. Ideal fluid approximation. Exact and approximate solutions to classical viscous and inviscid problems. Compressible and incompressible flows.
Prerequisite(s): MEE 503.

MEE 505 THERMODYNAMICS OF SOLIDS 3

Laws of thermodynamics, auxiliary functions, thermodynamic relations, phase transitions, thermodynamic equilibrium, thermodynamic properties of solid solutions, surfaces and interfaces.
Prerequisite(s): MEE 501 or permission of instructor.

MEE 506 MECHANICAL BEHAVIOR OF MATERIALS 3

Fundamental relationships between the structure and mechanical behavior of materials. Includes fundamentals of stress and strain, the physical basis for elastic deformation, elementary dislocation theory and plastic deformation, strengthening mechanisms, yield criteria and their application to biaxial and multi-axial behavior and failure, fracture and toughening mechanisms, creep and creep rupture, behavior and failure of cellular solids and fatigue.
Prerequisite(s): (MAT 501, 502) or permission of instructor.

MEE 508 PRINCIPLES OF MATERIAL SELECTION 3

Basic scientific and practical considerations involved in the intelligent selection of materials for specific applications. Impact of new developments in materials technology and analytical techniques.
Prerequisite(s): MEE 501 or permission of instructor.

MEE 509 INTRODUCTION TO POLYMER SCIENCE - THERMOPLASTICS 3

Broad technical overview of the nature of synthetic macromolecules, including the formation of polymers and their structure - property relationships, ploymer characterization and processing, and the applocation

of ploymers. Fundamental topics such as viscoelasticity, the glassy state, time-temperature superposition, polymer transitions, and free volume will also be reviewed. The course focuses on thermoplastic polymers.
Prerequisite(s): Organic chemistry; college physics, differential equations.

MEE 511 ADVANCED THERMODYNAMICS 3

Equilibrium, first law, second law, state principle, and zeroth law; development of entropy and temperature from availability concepts; chemical potential, chemical equilibrium, and phase equilibrium. Thermodynamics of irreversible processes; Onsager reciprocal relations; application of these concepts to direct energy conversion.

MEE 512 MICROSCOPIC THERMODYNAMICS 3

Microscopic thermodynamics; kinetic theory; virial theorem of Clausius; transport phenomena; Gibbs, Boltzman, Bose-Einstein, Fermi-Dirac statistics. Connection between statistical and thermodynamic quantities. Applications to perfect and real gases, liquids, crystalline solids, and thermal radiation. Irreversible thermodynamics.

MEE 513 PROPULSION 3

Principles of propulsive devices, aerothermodynamics; diffuser and nozzle flow; energy transfer in turbo-machinery; turbojet, turbo-fan, prop-fan engines; and turbo-prop and turboshaft engines. RAM and SCRAM jet analysis and a brief introduction to related materials and air frame-propulsion interaction.
Prerequisite(s): MEE 418.

MEE 515 CONDUCTION HEAT TRANSFER 3

Steady state and transient state conduction. Evaluation of temperature fields by formal mathematics and numerical analysis. Emphasis on approximate solution techniques.

MEE 516 CONVECTION HEAT AND MASS TRANSFER 3

Development of governing differential equations for convection. Methods of solution including similarity methods, integral methods, superposition of solutions, eigenvalue problems. Turbulent flow convection; integral methods, eddy diffusivities for heat and momentum. Extensions to mass transfer.
Prerequisite(s): MEE 410 or equivalent.

MEE 517 RADIATION HEAT TRANSFER 3

Fundamental relationships of radiation heat transfer. Radiation characteristics of surfaces. Geometric considerations in radiation exchange between surfaces. Emissivity and absorptivity of gases. Introduction to radiative exchange in gases.

MEE 518 PHASE CHANGE HEAT TRANSFER AND INTERFACIAL PHENOMENA 3

Interfacial thermodynamics of liquid-vapor-solid systems; surface wetting statics and dynamics; interfacial and phase stability; homogeneous and heterogeneous nucleation; and boiling heat transfer. Application to liquid-vapor phase change.

MEE 519 ANALYTICAL DYNAMICS 3

Dynamical analysis of a system of particles and rigid bodies; Lagrangian and Hamiltonian formulation of equations of motion; classical integrals of motion. Stability analysis of linear and nonlinear systems.
Prerequisite(s): (EGM 202; MTH 219) or equivalent.

MEE 520 THEORETICAL KINEMATICS 3

Introduction to the mathematical theory underlying the analysis of general spatial motion. Analysis of mechanical systems including robots, mechanisms, walking machines and mechanical hands using linear algebra, quaternion and screw formulations. Fundamental concepts include forward and inverse kinematics, workspace, Jacobians, and singularities.

MEE 521 KINEMATIC PRINCIPLES IN DESIGN 3

Study of the use of kinematic principles in the design of mechanical systems including robots, planar and spatial mechanisms, robotic platforms and systems modeled by jointed rigid bodies. The formulation and solution of design problems involving the sizing and placement of these mechanical systems to accomplish specific tasks is the primary goal. Mathematicl tools are introduced to account for singularity avoidance and joint limitations.

MEE 522 GEOMETRIC METHODS IN KINEMATICS 3

Trajectories and velocities of moving bodies are designed and analyzed via the principles of classical differential and algebraic geometry. Fundamentals include centrodes, instantaneous invariants, resultants and center point design curves. Curves, surfaces, metrics, manifolds and geodesics in spaces of more than three dimensions are analyzed to study multi-parameter systems.

MEE 523 ENGINEERING DESIGN OPTIMIZATION 3

Introduction to the theory and algorithms of nonlinear optimization with an emphasis on applied engineering problems. Fundamentals include Newton's method, line searches, trust regions, convergence rates, and linear programming. Advanced topics include penalty, barrier, and interior-point methods.

MEE 524 FUNDAMENTALS AND APPLICATIONS OF FUEL CELLS 3

The course will cover fundamental as well as engineering aspects of fuel cell technology. Specifically, the course will cover basic principles of electrochemistry, electrical conductivity (electronic and ionic) of solids, and development/design of major fuel cells (alkaline, polymer electrolyte, phosphoric acid, molten carbonate, and solid oxide). A major part of the course will focus on solid oxide fuel cells (SOFC), as it is emerging to be dominant among various fuel cell technologies. The SOFC can readily and safely use many common hydrocarbon fuels such as natural gas, diesel, gasoline, alcohol, and coal gas.
Prerequisite(s): (MEE 301, 312) or permission of instructor.

MEE 525 PRINCIPLES OF CORROSION 3

Theoretical and practical application of electrochemical principles to the field of corrosion covering thermodynamics, kinetics, forms of corrosion in areas of biomedical enigneering, aerospace, automotive and marine environments.
Prerequisite(s): MEE 501.

MEE 527 AUTOMATIC CONTROL THEORY 3

Stability and performance of automatic control systems. Classical methods of analysis including transfer functions, time-domain solutions, root locus and frequency response methods. Modern control theory techniques including state variable analysis, transformation to companion forms, controllability, pole placement, observability and observer systems.
Prerequisite(s): (ELE 432 or MEE 435) or equivalent.

MEE 533 THEORY OF ELASTICITY 3

Three-dimensional stress and strain at a point; equations of elasticity in Cartesian and curvilinear coordinates; methods of formulation of equations for solution; plane stress and plane strain; energy formulations; numerical solution procedures.
Prerequisite(s): EGM 303 or 330.
Corequisite(s): MEE 503.

MEE 534 THEORY OF PLATES AND SHELLS 3

Theory of plates: small and large displacement theories of thin plates; shear deformation; buckling; sandwich plate theory. Thin shell theory: theory of surfaces; thin shell equations in orthogonal curvilinear coordinates; bending, membrane, and shallow shell theories.
Prerequisite(s): MEE 533.

MEE 535 ADVANCED MECHANICAL VIBRATIONS 3

Review of undamped, damped, natural and forced vibrations of one and two degrees of freedom systems. Lagrange's equation, eigenvalue/eigenvector problem, modal analysis for discrete and continuous systems. Computer application for multi-degree of freedom, nonlinear problems.

Prerequisite(s): MEE 319; computer programming.

MEE 536 RANDOM VIBRATIONS 3

Introduction to probability distribution; characterization of random vibrations; harmonic analysis; auto- and cross-correlation and spectral density; coherence; response to single and multiple loadings; Fast Fourier Transform (FFT); applications in vibrations, vehicle dynamics, fatigue, etc.
Prerequisite(s): MEE 319; computer programming.

MEE 537 MECHATRONICS 3

Emphasis on the integration of sensors, micro-controllers, electromechanical actuators, and control theory in a 'smart' system for a semester-long design project. Topics include: sensor signal processing, electromechanical actuator fundamentals, interfacing of sensors and actuators to micro-controllers, digital logic, and programming of micro-controllers, programmable logic controllers and programmable logic devices. Equal mix of lecture and laboratory.
Prerequisite(s): Undergraduate electronics course.
Corequisite(s): Course in controls.

MEE 538 INTRODUCTION TO AEROELASTICITY 3

Study of the effect of aerodynamic forces on a flexible aircraft. Flexibility coefficients and natural modes of vibration. Quasi-steady aerodynamics. Static aeroelastic problems; wing divergence and dynamic aeroelasticity; wing flutter. An introduction to structural stability augmentation with controls.
Prerequisite(s): AEE 501.

MEE 539 THEORY OF PLASTICITY 3

Fundamentals of plasticity theory including elastic, viscoelastic, and elastic-plastic constitutive models; plastic deformation on the macroscopic and microscopic levels; stress-strain relations in the plastic regime; strain hardening; limit analysis; numerical procedures.
Prerequisite(s): MEE 503 or 533.

MEE 540 TRIBOLOGY 3

Theoretical aspects of lubrication; determination of pressure distribution in bearings from viscous flow theory; application of hydrodynamic and hydrostatic bearing theories to the design of bearings; high-speed bearing design problems; properties of lubricants; methods of testing.

MEE 541 EXPERIMENTAL MECHANICS OF COMPOSITE MATERIALS 3

Introduction to the mechanical response of fiber-reinforced composite materials with emphasis on the development of experimental methodology. Analytical topics include stress-strain behavior of anisotropic materials, laminate mechanics, and strength analysis. Theoretical models are applied to the analysis of experimental techniques used for characterizing composite materials. Lectures are supplemented by laboratory sessions in which characterization tests are performed on contemporary composites.
Prerequisite(s): EGM 303 or 330.

MEE 542 ADVANCED COMPOSITES 3

Materials and processing. Comprehensive introduction to advanced fiber reinforced polymeric matrix composites. Constituent materials and composite processing will be emphasized with special emphasis placed on structure-property relationships, the role of the matrix in composite processing, mechanical behavior and laminate processing. Specific topics will include starting materials, material forms, processing, quality assurance, test methods and mechanical behavior.
Prerequisite(s): (MEE 501 or 509) or permission of instructor.

MEE 543 ANALYTICAL MECHANICS OF COMPOSITE MATERIALS 3

Analytical models are developed to predicting the mechanical and thermal behavior of fiber-reinforced composite materials as a function of constituent material properties. Both continuous and discontinuous fiber-reinforced systems are considered. Specific topics include basic mechanics of anisotropic materials, micromechanics, lamination theory, free-edge effects, and failure criteria.
Prerequisite(s): EGM 303 or 330.

MEE 544 MECHANICS OF COMPOSITE STRUCTURES 3

Comprehensive treatment of laminated beams, plates, and sandwich structures. Effect of heterogeneity and anisotropy on bending under lateral loads, buckling, and free vibration are emphasized. Shear deformation and other higher-order theories and their range of parametric application are also considered.
Prerequisite(s): MEE 543 or permission of instructor.

MEE 545 COMPUTATIONAL METHODS FOR DESIGN 3

Modeling of mechanical systems and structures, analysis by analytical and numerical methods, development of mechanical design criteria and principles of optimum design, selected topics in mechanical design and analysis, use of the digital computer as an aid in the design of mechanical elements.
Prerequisite(s): Computer programming.

MEE 546 FINITE ELEMENT ANALYSIS I 3

Fundamental development of the Finite Element Method (FEM), and solution of field problems and comprehensive structural problems, variational principles and weak-forms; finite element discretization; shape functions; finite elements for field problems; bar, beam, plate, and shell elements; isoparametric finite elements; stiffness, nodal force, and mass matrices; matrix assembly procedures; computer dosing techniques; modeling decisions; program output interpretation. Course emphasis on a thorough understanding of FEM theory and modeling techniques.
Prerequisite(s): MEE 503 or 533.

MEE 547 FINITE ELEMENT ANALYSIS II 3

Advanced topics: heat transfer; transient dynamics; nonlinear analysis; substructuring and static condensation; effects of inexact numerical integration and element incompatibility; patch test; frontal solution techniques; selected topics from the recent literature.
Prerequisite(s): MEE 546.

MEE 548 ENERGY METHODS IN SOLID MECHANICS 3

Development of fundamental energy principles; virtual displacements, strain energy, Castigliano's theorems, minimum potential energy principles. Applications to engineering problems; redundant structures, buckling, static and dynamic analysis.
Prerequisite(s): MEE 503 or 533.

MEE 549 THEORY OF ELASTIC STABILITY 3

Introduction to stability theory: buckling of plates and shells; influence of initial imperfections; nonlinear analysis: numerical solutions methods.
Prerequisite(s): MEE 533.

MEE 550 MECHANICAL ENGINEERING PROJECT 1 - 6

Student participation in a departmental research, design, or development project under the direction of a project advisor. The student must show satisfactory progress as determined by the project advisor and present a written report at the conclusion of the project.

MEE 551 NOISE AND VIBRATION CONTROL 3

The concepts of noise and vibration control applied to mechanical systems. Methodologies covered will include: passive treatments using resistive elements (sound absorbers, vibration damping) and reactive elements (tailoring of material stiffness and mass); active control of sound and vibration; and numerical analysis.
Prerequisite(s): MEE 319 or 439.

MEE 552 BOUNDARY LAYER THEORY 3

Development of the Prandtl boundary layer approximation in two and three dimensions for both compressible and incompressible flow. Exact and approximate solutions for laminar flows. Unsteady boundary layers. Linear stability theory and transition to turbulence. Empirical and semi-empirical methods for turbulent boundary layers. Higher-order boundary layer theory.
Prerequisite(s): MEE 504 or equivalent.

MEE 553 COMPRESSIBLE FLOW 3

Fundamental equations of compressible flow. Introduction to flow in two and three dimensions. Two-dimensional supersonic flow, small perturbation theory, method of characteristics, oblique shock theory. Introduction to unsteady one-dimensional motion and shock tube theory. Method of surface singularities.
Prerequisite(s): MEE 504 or equivalent.

MEE 555 TURBULENCE 3

Origin, evolution, and dynamics of fully turbulent flows. Description of statistical theory, spectral dynamics, and the energy cascade. Characteristics of wall-bounded and free turbulent shear flows. Reynolds stress models.
Prerequisite(s): MEE 504 or equivalent.

MEE 558 COMPUTATIONAL FLUID DYNAMICS 3

Numerical solution to Navier-Stokes equations and approximations such as the boundary layer equations for air-flow about a slender body. Numerical techniques for the solution of the transonic small disturbance equations. Numerical determination of fluid instabilities.
Prerequisite(s): MEE 504 or permission of instructor.

MEE 560 PROPULSION SYSTEMS 3

Introduction and history, types of propulsion systems, thermodynamics review and simple cycle analysis, thermodynamics of high speed gas flow, aircraft gas turbine engine, parametric cycle analysis of various types of gas turbine engines, component and engine performance analyses (inter-turbine burners), advanced cycles with regeneration, reheating, and inter-cooling, variable and inverse cycle engines, hybrid propulsion systems (turbo-ramjets, rocket-ram-scramjets, etc.) advanced propulsion systems, pulse detonation engine theory and concepts, thermal management of high-speed flight, energy management and vehicle synthesis.
Prerequisite(s): (MEE 413 or 513) or permission of instructor.

MEE 565 FUNDAMENTALS OF FUELS AND COMBUSTION 3

Heat of combustion and flame temperature calculations; rate of chemical reaction and Arrhenius relationship; theory of thermal explosions and the concept of ignition delay and critical mass; phenomena associated with hydrocarbon-air combustion; specific applications of combustion.

MEE 566 COMBUSTION THEORY 3

Theory of detonation (Rankine-Hugoniot relationships) and flame propagation rates in pre-gas mixed systems; turbulent flames and the well stirred reactor; theory of diffusion flames; fuel droplet combustion; steady burning of solid materials, ignition and flame spreading across solid materials.

MEE 567 SMART STRUCTURES AND MATERIALS OVERVIEW 3

Smart structures and materials overview. Components of materials, sensing, actuation, and modeling. Electro-mechanical and thermo-mechanical modeling of SMA and piezo-ceramic materials. Elements of control, sensing, and vibration theory. Examples of using piezo-ceramic and shape memory alloy (SMA) based structures for actuation, vibration, position, and shape control with applications in automotive, aircraft, and satellites.
Prerequisite(s): Background in materials, electronics, vibrations, and controls or instructor's consent. MEE 312 or instructor's consent

MEE 568 INTERNAL COMBUSTION ENGINES 3

Study of combustion and energy release processes. Applications to spark and compression ignition, jet, rocket, and gas turbine engines. Special emphasis given to understanding of air pollution problems caused by internal combustion engines. Idealized and actual cycles are studied in preparation for laboratory testing of internal combustion engines.

MEE 569 HEATING AND AIR CONDITIONING 3

Topics dealing with thermal environments and methods of control. Included are psychometrics, solar radiation, heat transmission through solid boundaries, industrial and residential environments, residential heating and cooling load calculations.

MEE 570 FRACTURE MECHANICS 3

Application of the principles of fracture mechanics to problems associated with fatigue and fracture in engineering structures. The course will cover the development of models that apply to a range of materials, geometries, and loading conditions.
Prerequisite(s): MEE 506 or permission of instructor.

MEE 571 DESIGN OF THERMAL SYSTEMS 3

Integration of thermodynamics, heat transfer, engineering economics, and simulation and optimization techniques in a design framework. Topics include design methodology, exergy analysis, heat exchanger networks, thermal-system simulation, and optimization techniques.

MEE 572 DESIGN FOR ENVIRONMENT 3

Emphasis on design for environment over the life cycle of a product or process, including consideration of mining, processing, manufacturing, use, and post-life stages. Course provides knowledge and experience in invention for the purpose of clean design, life cycle asessment strategies to estimate the environmental impact of products and processes, and cleaner manufacturing practices. Course includes a major design project.

MEE 573 RENEWABLE ENERGY SYSTEMS 3

Introduction to the impact of energy on the economy and environment. Engineering models of solar thermal and photovoltaic systems. Introduction to wind power. Fuel cells and renewable sources of hydrogen.

MEE 574 VIRTUAL PROTO-TYPING OF PRODUCTS AND PROCESSES 3

The use of virtual prototyping for validating/optimizing the product design and the corresponding manufacturing process(es) before building the physical prototype will be practiced.
Prerequisite(s): MEE 427.

MEE 575 FRACTURE AND FATIGUE OF METALS AND ALLOYS I 3

This course will cover the effects of microstructure on the fracture and fatigue behavior of engineering metals and alloys with a special emphasis on static and dynamic brittle and ductile failures and crack initiation. Alloy fracture resistance, fracture toughness, fatigue behavior ,and methods to improve fracture and fatigue behavior will be discussed in detail. Various analytical techniques for failure of stuctural components will be presented. A practical failure- analysis project will be performed.
Prerequisite(s): (MEE 501 or 506) or permission of instructor.

MEE 576 FRACTURE AND FATIGUE OF METALS AND ALLOYS II 3

This course will cover the areas of the effects of microstructure on fatigue crack propagation on fracture and fatigue. This will include fatigue life prediction using damage tolerance approach to component design and microstructural and structural synthesis for optimum behavior. Specific material-related aspects of fatigue crack propagation mechanisms for optimum damage tolerant behavior, and the analysis of aerospace metallic components will also be conducted.
Prerequisite(s): MEE 575 or equivalent.

MEE 577 ROBOTICS AND NUMERICALLY CONTROLLED MACHINES 3

Introduction to robots. Design and analysis of wrist mechanisms and grippers. Robot kinematics and trajectory planning. Sensors and vision systems. Implementation and applications of robotics. Robot cell design and control. Interaction of robot with the environment. NC and CNC machines and machining centers. Fundamentals of rapid prototyping.
Prerequisite(s): MEE 435 or equivalent.

MEE 579 COMPUTER AIDED MECHANICAL DESIGN 3

Introduction to computer methods used to facilitate mechanical design. Design using the finite element method, mechanism design, and statistical techniques. Design of components (shafts, springs, etc.) using computer techniques will be combined with the design process to design mechanical systems. Integration of manufacturer's literature into the design. Team design project will be included.
Prerequisite(s): (MEE 427, 432) or equivalent.

MEE 580 STATISTICAL PROCESS CONTROL BY FEEDBACK ADJUSTMENT 3

Process monitoring using standard quality control techniques provides an ongoing check on the stability of the process and points to problems whose elimination can reduce variation and permanently improve the system. Process adjustment uses feedback control to compensate for those sources of drifting variation that cannot be eliminated in this way. Clearly the two approaches are complementary and considerable advantage is to be gained by augmenting the more commonly used quality control techniques with feed back methods.
Prerequisite(s): Background in statistics or permission of instructor.

MEE 582 AUTOMATED DESIGN 3

Examine, discuss, and apply enabling design technologies, methodologies and computer tools to various mechanical product design and manufacturing process design projects. Address selected design topics and how they are used in Product Development Cycle. Model, simulate, and evaluate various mechanical products and manufacturing process designs.

MEE 584 INTEGRATED MANUFACTURING SYSTEMS 3

Treatment of topics associated with the design, implementation, planning and control of fixed and flexible manufacturing and assembly systems in conjunction with communications and computer technologies. Discuss issues associated with group technology and systems integration.

MEE 585 DESIGN FOR PRODUCIBILITY 3

Concurrent treatment of product design and manufacturing process issues. Application of various methodologies, tools, and evaluation schemes on various product design, manufacturing, and assembly-related activities.

MEE 587 LEAN MANUFACTURING 3

Introduction to lean manufacturing and waste elimination. Dynamics of team formation: participation, leadership, communication, and conflict resolution. Concepts of work standardization. Process flow mapping techniques. Setup reduction: reduction of cycle time and inventory in manufacturing operations. Design of lean manufacturing work cells: basic work motions, applied ergonomics, and time studies. Just-in-time. Pull production: Kanbans and their effect on reducing inventory and lead-time. Error proofing: error detection, feedback, corrective and preventive actions. Value added vs. non-value added analysis.
Prerequisite(s): MEE 344 or equivalent.

MEE 595 SPECIAL PROBLEMS IN MECHANICAL ENGINEERING 1 - 6

Special assignments in mechanical engineering subject matter arranged and approved by the student's faculty advisor and the department chair.

MEE 599 THESIS 1 - 6

MEE 604 NANOSTRUCTURED MATERIALS 3

A graduate-level course covering the fundamental physics, properties, and applications of nanostructured materials. Includes carbon nanotubes, nanostructured ceramics, metals, and semiconductor materials.
Prerequisite(s): College physics; fundamental physical and chemical properties of materials.

MEE 605 INTRODUCTION TO CARBON NANOTECHNOLOGY 3

A graduate-level course covering the fundamental and applied aspects of Carbon Nanoscale Science and Technology. The course has three goals: (1) an overview of the current development in carbon science and technology (2) an introduction to the surface science as a means to understand the surface interaction at molecular scale, and (3) to provide some explicit links between macro, micro, and nano scale technologies. Some of the medical field, structural and friction applications will be addressed. This course is aimed at both science and engineering students.

MEE 690 SELECTED READINGS 1 - 6

Directed readings in a designated area arranged and approved by the student's doctoral advisory committee and the department chair. May be repeated. (A) Materials, (B) Thermal Sciences, (C) Fluid Mechanics, (D) Solid Mechanics (E) Mechanical Design, or (F) Integrated Manufacturing.

MEE 695 SPECIAL PROBLEMS IN MECHANICAL ENGINEERING 1 - 6

Special assignments in mechanical engineering subject matter arranged and approved by the student's doctoral advisory committee and the department chair. May be repeated.

MEE 698 D.E. DISSERTATION 1 - 15

An original investigation as applied to mechanical engineering practice. Results must be of sufficient importance to merit publication.

MEE 699 Ph.D. DISSERTATION 1 - 15

An original research effort which makes a definite contribution to technical knowledge. Results must be of sufficient importance to merit publication.

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College of Arts and Sciences

(MUS) Music (Collapse Description)

Dr. Donna M. Cox, Chair of the Department
Dr. Linda A. Hartley, Coordinator, Music Education

The Department of Music offers courses in support of the Master of Science in education degree with a music education concentration. For specific degree requirements visit the Department of Teacher Education in Academic Information. The Department of Music is a member of the National Association of Schools of Music, which accredits its degree programs and curricula.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
MUS 501	GRADUATE SEMINAR IN MUSICOLOGY.	2

Students will become familiar with selected general aspects of Western music: music notation, editions and performance, social contexts and meanings of musical works. This course explores the range of approaches and research methods in musicology, aiming for a comprehensive understanding and a critical knowledge of the sources and literature of music and musicology, and the rudiments of research and writing techniques.

MUS 503	TEACHING WORLD MUSIC	2

Methods and techniques for teaching music from representative cultures around the world, and their role and function in society.

MUS 505	TEACHING MUSIC WITH TECHNOLOGY I	2

Provides a hands-on, introductory basis in 1) computer aided notation, 2) recording music with digital instruments, 3) developing multimedia presentations, and 4) utilizing the world wide web for connected learning.

MUS 506	TEACHING MUSIC WITH TECHNOLOGY II	2

Provides an in-depth and hands-on study in 1) computer aided notation, 2) recording music with digital instruments, 3) developing multimedia presentations, and 4) utilizing the world wide web for connected learning. Permission of the instructor required.

MUS 511	MUSIC THEORY, ANALYSIS, AND TECHNOLOGY	2

Investigates music theory and compositional practice of the Western music tradition. Current techniques of tonal theory including linear analysis are explored. Students will also apply music technology in the notation and analysis of music.

MUS 531	FOUNDATIONS AND CURRENT ISSUES IN MUSIC EDUCATION	2

Topics include history, philosophy, and psychology of music education; special needs and inclusion; assessment; national and state music education standards; gifted identification; curriculum development; scheduling; Vision 2020; and learning theories.

MUS 535	LITERATURE AND RESOURCES FOR CLASSROOM MUSIC	1

Review, analysis and critique of standard and new literature for grades PreK - 8. Exploration and utilization of available teaching resources.

MUS 536	LITERATURE AND RESOURCES FOR THE CHORAL ENSEMBLE	1

Review, analysis and critique of standard and new literature for elementary, middle, and high school choral ensembles.

MUS 537 LITERATURE AND RESOURCES FOR THE INSTRUMENTAL ENSEMBLE 1

Review, analysis and critique of standard and new literature for elementary, middle, and high school instrumental ensembles.

MUS 544 ADVANCED TECHNIQUES FOR CLASSROOM MUSIC 2

Focuses on the development of teaching techniques and methods for grade levels PreK-8. Concentration on areas such as contemporary methodologies, learning theories, and utilization of the National Standards in music education.

MUS 545 ADVANCED CHORAL CONDUCTING AND REHEARSAL TECHNIQUES 2

Focuses on score study, comprehensive score analysis, performance practice study, ensemble conducting experience, and rehearsal techniques.

MUS 546 ADVANCED INSTRUMENTAL CONDUCTING AND REHEARSAL TECHNIQUES 2

Focuses on score study, comprehensive score analysis, performance practice study, ensemble conducting experience, and rehearsal techniques.

MUS 581 IMPROVISATION IN THE SCHOOL MUSIC CURRICULUM 2

Emphasis on vocal and instrumental skill development and facilitation of improvisatory experiences suitable for individual students and groups.

MUS 599 GRADUATE PERFORMANCE STUDIES 1

Private lesson instruction, or performance in an approved ensemble (large group or chamber). Lessons (14, 30 minutes each or equivalent) offered in keyboard, strings, winds, percussion, and voice. Ensembles can include university ensembles as well as off-campus ensembles (must have approval of advisor). Fee for lessons.

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College of Arts and Sciences

(PHL) Philosophy (Collapse Description)

William M. Richards, Chair of the Department

* There is no graduate program in philosophy at this time. The courses listed below support other graduate programs.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
PHL 621	AMERICAN PRAGMATISM	0
PHL 653	AESTHETICS	0
PHL 654	PHILOSOPHY OF RELIGION	0
PHL 655	SOCIAL AND POLITICAL PHILOSOPHY	0
PHL 690	SEMINAR	0

PHL 690 is regularly taught for the School of Law. PHL 653 is still sometimes taught for the School of Education & Allied Professions.

PHL 695	DIRECTED STUDIES	3

To augment the graduate student's previous training or to allow advanced study on a particular problem, philosopher, or historical era. Arrange through the department chair.

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Art Education (MSE.EAR) (EDT)

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College of Arts and Sciences

(PHY) Physics (Collapse Description)

Dr. J. Michael O'Hare, Chair of the Department
Dr. Peter Powers, Graduate Program Director

The Department of Physics, as part of the electro-optics program, offers graduate courses in support of the Master of Science and Doctor of Philosophy in electro-optics. For more details on the program requirements, see electro-optics (EOP) in Academic Information.

Assistantships

A limited number of graduate assistantships are available for graduate students in the electro-optics program. These generally carry a stipend and tuition remission for the courses required for the degree. Recipients are expected to complete the requirements for the Master's degree in two years. Detailed information and application forms may be obtained from the chair of the physics department or the director of the electro-optics program.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
PHY 520	SOLID STATE PHYSICS	3

Crystal structure, thermal properties of solids; insulators; band theory of solids; semiconductors; luminescence.

Code	Title	Sem. Hrs.
PHY 525	QUANTUM MECHANICS I	3

The physical basis of quantum mechanics, wave packets, free particle motion: Schrodinger's equation applied to potential problems; harmonic oscillator and the hydrogen atom; three-dimensional extrapolation and scattering.

Code	Title	Sem. Hrs.
PHY 599	GEOMETRIC OPTICS	3

Wavefronts and rays; Fermat's principle; Gaussian optics and axially symmetric systems; aperture stops; pupils and fields lenses; Lagrange invariant; angular and visual magnification; optical systems; plane mirrors and prisms; aberration theory; introduction to computer ray tracing.

Code	Title	Sem. Hrs.
PHY 599	INTRODUCTION TO LASERS	3

Laser theory; coherence; Gaussian beams; optical resonators; properties of atomic and molecular radiation; laser oscillation and amplification; methods of excitation of lasers; characteristics of common lasers; laser applications. **Prerequisite(s):** (EOP 502 or (a working knowledge of Maxwell's equations; physical optics)) or permission of instructor or program director.

Code	Title	Sem. Hrs.
PHY 599	OPTICAL RADIATION AND MATTER	3

Maxwell's equations; electromagnetic waves; interaction of radiation with atomic electrons; molecular and lattice vibration; study of phenomena related to the interaction of optical radiation with matter; polarization; crystal optics; nonlinear dielectric effects.

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College of Arts and Sciences

(POL) Political Science (Collapse Description)

Christopher M. Duncan, Chair of the Department
Peter B. Nelson, Director, MPA Program

The Department of Political Science offers one graduate degree, the Master of Public Administration. The Master of Public Administration is a professional degree designed to prepare students for administrative careers in contemporary society.

Assistantships

The department offers three graduate assistantships each year. The graduate assistants perform research and administrative tasks for the faculty. Each assistant receives full tuition remission plus stipend. An assistantship, once granted, is renewable for a second year.

Programs

Program Name

Master of Public Administration (MPA)

To receive the Master of Public Administration degree, the student must satisfactorily complete 39 semester hours of coursework with a cumulative grade point average of 3.0 or better.

- The 39 hours of coursework must include MPA 500, 510, 511, 520, 530 and 540. The required courses may be waived for students with appropriate academic backgrounds.
- The remainder of the 39 hours must consist of courses selected from the MPA curriculum. Exceptions may be made, on the determination of the program director, if the students career objectives make public management-related courses in other graduate programs particularly useful. No more than 6 semester hours outside the MPA curriculum may be taken.

Within the general requirements listed above, the student may select one of three options:

1. The student may take 33 to 36 semester hours of academic coursework and three to six semester hours of MPA 595, Government Internship. A student choosing this option is encouraged to begin the internship only after completing 18 semester hours of other courses. The internship is required of pre-career students.
2. The student, under certain conditions, may take 33 to 36 semester hours of academic coursework and three to six semester hours of MPA 597, Public Service Project. This option is available only to students employed in administrative positions other than internships in public or nonprofit agencies. Students should enroll in MPA 597 only after completing 18 hours of other courses.
3. The student may take the full 39 semester hours in regular academic courses.

		Sem. Hrs.
Public Administration[1]		**36**
MPA 500	PUBLIC ADMINISTRATION	3
MPA 510	QUANTITATIVE METHODS IN PUBLIC ADMINISTRATION	3
MPA 511	APPLIED RESEARCH TECHNIQUES	3
MPA 520	ORGANIZATION THEORY	3
MPA 530	FISCAL ADMINISTRATION	3
MPA 540	PUBLIC SECTOR HUMAN RESOURCE MANAGEMENT	3
MPA Electives (selected from the MPA curriculum)[2]		21

MPA Curriculum

General Administration and Management

MPA 500	PUBLIC ADMINISTRATION	3
MPA 502	INTERGOVERNMENTAL RELATIONS	3
MPA 504	STATE AND LOCAL GOVERNMENT	3
MPA 506	URBAN ADMINISTRATION	3
MPA 508	CONTEMPORARY ISSUES IN PUBLIC MANAGEMENT	3

Analytic Tools

MPA 510	QUANTITATIVE METHODS IN PUBLIC ADMINISTRATION	3
MPA 511	APPLIED RESEARCH TECHNIQUES	3
MPA 512	COMPUTER APPLICATIONS FOR PUBLIC ADMINISTRATION	3
MPA 514	GOVERNMENT PLANNING	3

Group and Organization Dynamics

COM 517	ORGANIZATIONAL COMMUNICATION	3
COM 537	CONFLICT MANAGEMENT	3
MPA 520	ORGANIZATION THEORY	3
MPA 524	ETHICS IN PUBLIC ADMINISTRATION	3
MPA 526	LEADERSHIP IN BUILDING COMMUNITIES	3

Fiscal Management

MPA 530	FISCAL ADMINISTRATION	3
MPA 532	GOVERNMENTAL FUND MANAGEMENT AND REPORTING	3

Human Resources

MPA 540	PUBLIC SECTOR HUMAN RESOURCE MANAGEMENT	3
MPA 542	PUBLIC SECTOR LABOR MANAGEMENT RELATIONS	3

Policy Studies

MPA 551	INTRODUCTION TO PUBLIC POLICY	3
MPA 555	SELECTED TOPICS IN PUBLIC POLICY	3

The Nonprofit Sector

MPA 561	INTRODUCTION TO NONPROFIT ORGANIZATIONS	3

Public Law/Bureaucracy

MPA 571	ADMINISTRATIVE LAW	3

Topical Seminars/Independent Work

MPA 591	SEMINAR IN PUBLIC ADMINISTRATION	3
MPA 593	INDEPENDENT STUDY IN PUBLIC ADMINISTRATION	3 - 6
MPA 595	GOVERNMENT INTERNSHIP	1 - 6
MPA 597	PUBLIC SERVICE PROJECT	3

[1]The required courses may be waived for students with appropriate academic backgrounds.

[2]Exceptions may be made, on the determination of the program director, if the student's career objectives make public management-related courses in other graduate programs particularly useful. No more than six semester hours outside the MPA curriculum may be taken.

Courses (Collapse All Courses)

Code Title Sem. Hrs.

MPA 500 PUBLIC ADMINISTRATION 3

Study of administrative organization, systems, processes and methods as applied to government programs and operations, with a comparison of structural and behavioral approaches.

MPA 502 INTERGOVERNMENTAL RELATIONS 3

Study of the interaction processes of various levels of government in the United States, including problems of federalism, interstate cooperation, and federal-urban relations.

MPA 504 STATE AND LOCAL GOVERNMENT 3

An in-depth examination of particular state-local institutional relationships with emphasis upon current issues.

MPA 506 URBAN ADMINISTRATION 3

Study of the structures, processes, programs, policies and problems of administrative agencies of local government, with particular emphasis on metropolitan areas.

MPA 508 CONTEMPORARY ISSUES IN PUBLIC MANAGEMENT 3

An in-depth examination of a current management issue supported by recent literature in public administration and relevant to surrounding local governments. Analysis of root causes of the problem issue. Exploration of management approaches available to local governments. May be repeated once when course focus changes.

MPA 510 QUANTITATIVE METHODS IN PUBLIC ADMINISTRATION 3

Introduction to research techniques involving quantitative methods and analysis applicable to the formation and implementation of public programs. Emphasis on basic statistics and research methodology. Aimed at understanding appropriate application and interpretation of quantitative methods rather than competence in practical or scholarly use.

MPA 511 APPLIED RESEARCH TECHNIQUES 3

Introduction to statistical computing techniques, review of research design and inferential statistics, Ordinary Least Square techniques, violations of assumptions, multi-level modeling, and other topics.
Prerequisite(s): MPA 510

MPA 512 COMPUTER APPLICATIONS FOR PUBLIC ADMINISTRATION 3

Microcomputer applications in the practice of public administration and policy research. Course strongly oriented toward problem solving.

MPA 514 GOVERNMENT PLANNING 3

Consideration of the planning function in the administrative process and the role of planning agencies in decision-making and problem solving. Evaluation of trends and changing planning characteristics in the United States.

MPA 520 ORGANIZATION THEORY 3

Survey of current literature and research on the theory of complex organizations. Rationality in decision making; problems of authority; behavioral, political, and technical influences on organization.

MPA 524 ETHICS IN PUBLIC ADMINISTRATION 3

This course stimulates an awareness of the moral dimension of public sector problems and decision making contexts. It provides students the tools and techniques they can use to meet demands for ethical judgments and decisive action in their public management careers.

MPA 526 LEADERSHIP IN BUILDING COMMUNITIES 3

Seminar class where teams are formed to learn about the processes of building a neighborhood and recommending supportive public policy and other strategic interventions. Participants will be encouraged to refine their notions of community and leadership and to recommend strategies which capitalize on neighborhood assets, improve outcomes, and build community.

MPA 530 FISCAL ADMINISTRATION 3

Study of governmental expenditures and revenues, budgetary and financial reporting, fiscal policy, and other areas of fiscal management, with emphasis on current practices and problems.

MPA 532 GOVERNMENTAL FUND MANAGEMENT AND REPORTING 3

Examination of the fund structures within local/state governments and selected nonprofit entities. Emphasis upon understanding the managerial implications of financial statements and reports.

MPA 540 PUBLIC SECTOR HUMAN RESOURCE MANAGEMENT 3

A broad-based study of people management ranging from the development and integration of organizational policy, through the many personnel administrative processes, and the human and regulatory aspects affecting the contemporary public sector workforce.

MPA 542 PUBLIC SECTOR LABOR MANAGEMENT RELATIONS 3

This course is designed to focus on the labor relations' function as it is found in the public sector. Topics to be covered include the rise of government employee labor unions, collective bargaining, and policy impacts of public employee unions.

MPA 551 INTRODUCTION TO PUBLIC POLICY 3

This course is designed to introduce students to the study of public policy and public policymaking. The central concerns of the course involve competing models of the policy process, the policymaking process in the United States, the interplay between the political and economic systems in policymaking, and the processes of policy analysis and evaluation.

MPA 555 SELECTED TOPICS IN PUBLIC POLICY 3

Policy process, policy outcomes, and policy impact in an area or areas of public policy varying among such topics as transportation, education, welfare, national defense, science, civil rights, and urban and community development. May be repeated when topic changes.

MPA 561 INTRODUCTION TO NONPROFIT ORGANIZATIONS 3

This course surveys the generalized body of knowledge common to all nonprofit organizations, distinguishing them from governmental and for-profit entities. Emphasis placed upon an overall understanding of the nonprofit sector and its emerging role in society.

MPA 571 ADMINISTRATIVE LAW 3

Study of the judicial function and activities of federal agencies; formal and informal processes in administrative hearings; basic principles of administrative law; judicial interpretation; the question of increased judicialization of the administrative process.

MPA 591 SEMINAR IN PUBLIC ADMINISTRATION 3

Seminar on selected problems in public administration. Students are expected (as individuals or team members) to produce a research manuscript suitable for professional dissemination. May be repeated when topic changes.

MPA 593 INDEPENDENT STUDY IN PUBLIC ADMINISTRATION 3 - 6

Intensive independent research under the direction of a faculty member. Research paper. May be repeated when topic changes. Prior approval of formal project proposal required.

MPA 595 GOVERNMENT INTERNSHIP 1 - 6

Assignment to appropriate government agencies or units for the purpose of gaining wide experience with the administrative system through a program of work experiences. Internship includes a related academic requirement.

MPA 597 PUBLIC SERVICE PROJECT 3

For students currently employed in administrative positions in public or nonprofit agencies. Completion of a written project relating theories and information from the field of public administration to the student's work experience and career objectives. Prior approval of formal project proposal required.

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the Bulletin
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→ Explore a Different Issue

College of Arts and Sciences

(PSY) Psychology (Collapse Description)

David W. Biers, Chair of the Department and Interim Director of General Program
Roger N. Reeb, Director of Graduate Programs and Clinical Program
William F. Moroney, Director of Experimental-Human Factors Program

The Department of Psychology offers three graduate programs leading to the Master of Arts:

- Clinical Psychology
- Experimental-Human Factors Psychology
- General Psychology

All programs emphasize the integration of theory and research with appropriate applied experience and competence in the development of relevant and original research. This is the product of individual supervision and a low student-to-faculty ratio. The aim of the department is to prepare the student for further graduate studies at the doctoral level, and/or work at the M.A. level in an applied/community, teaching, or research setting. Academic advisors and the department chair will direct students to faculty members who share their specific interests and areas of specialization. Graduate students are encouraged to work with these faculty members on a one-to-one basis.

Assistantships

Graduate assistantships are available on a competitive basis and include a stipend as well as tuition and fee remission. The Department of Psychology also offers a limited number of traineeships to students in the clinical psychology program. The traineeship placements are at local mental health agencies and vary in number and stipend from year to year depending upon the budgets and needs of the agencies participating in the traineeship program.

Programs (Collapse All)

Program Name

Master of Arts in Clinical Psychology (PSY)

The clinical psychology program is designed with the scientist-practitioner model as its foundation. In addition to a broad academic background and competence in the application of research methodology, this program provides the student with:

1. theoretical and practical knowledge in the areas of personality, psychopathology, and psychotherapy,
2. intensive training in the assessment of intelligence and personality,
3. supervised practice in interviewing and therapeutic intervention, and
4. the opportunity to emphasize work with either children or adults.

Through practicum experience in various community and clinical settings affiliated with the University, the student can translate classroom learning into practical experience. The clinical program is designed to prepare the student for employment in clinical positions at the master's level or for further study in clinical psychology at the doctoral level, and is accredited by the Masters in Psychology Accreditation Council (MPAC).

All students enrolled in any of the three programs leading to the Master of Arts with a major in Psychology are subject to the following general requirements of the Department of Psychology.

1. The number of semester hours and required courses described below.

2. Demonstration of satisfactory progress toward the degree that includes the requirement that students maintain a minimum average of B (3.00) in coursework. Students who fail to meet this requirement are either placed on academic probation or dismissed from the program.
3. Students are permitted no more than six semester hours with grades of C or lower. Students who fail to meet this requirement are dismissed from the program.
4. No more than six semester hours of 400-level courses may apply toward the master's degree, and normally no more than six semester hours of graduate work approved by the department chair may be transferred from other institutions.
5. Attendance is required at regularly scheduled extra-course seminars on selected issues in psychology and at occasional specialized programs.
6. Thesis must deal with an approved research problem, incorporating an appropriate review of theory and literature, and demonstrating competence in the application of research methodology.
7. Students are expected to conduct themselves in a professional and ethical manner in accordance with generally accepted standards for psychologists. Failure to do so may result in dismissal.
8. It is the student's responsibility to know and to meet the requirements of the University and of the graduate program.

The Master of Arts with a major in psychology (clinical) requires 46 semester hours consisting of 42 hours of academic coursework, including thesis, and 4 hours of practicum as specified below. Full-time students normally complete program requirements in two years.

		Sem. Hrs.
Clinical Psychology		**46**
Psychology Core Requirements		12
PSY 501	EXPERIMENTAL DESIGN AND STATISTICS I	3
PSY 502	EXPERIMENTAL DESIGN AND STATISTICS II	3
PSY 510	HISTORY & SYSTEMS	3
PSY 599	THESIS	3
Clinical Core Requirements		28
PSY 550	INTRODUCTION TO CLINICAL PSYCHOLOGY	3
PSY 551	ASSESSMENT OF INTELLIGENCE	3
PSY 553	THEORIES AND RESEARCH IN PSYCHOPATHOLOGY	3
PSY 555	THEORIES OF PERSONALITY AND PSYCHOTHERAPY	3
PSY 556	ASSESSMENT OF PERSONALITY	3
PSY 564	INDIVIDUAL PSYCHOTHERAPY	3
PSY 565	ETHICAL & CULTURAL ISSUES IN CLINICAL ASSESSMENT AND PSYCHOTHERAPY	3
PSY 569	CLINICAL PRACTICUM	1
PSY 573	DEVELOPMENTAL PSYCHOLOGY	3
Child Emphasis Requirements		6
PSY 560	CHILDHOOD PSYCHOPATHOLOGY AND PSYCHOTHERAPY	3
PSY 566[1]	MARRIAGE AND FAMILY THERAPY	3
Adult Emphasis Requirements		6
PSY 558[1]	GROUP PSYCHOTHERAPY	3
PSY 566[1]	MARRIAGE AND FAMILY THERAPY	3

[1]With approval of the Director of the Clinical Program, an elective may be substituted for either PSY 558 or 566.

Master of Arts in Experimental-Human Factors Psychology (PSY)

The master's program in experimental-human factors psychology is designed for the student who wishes to integrate the theory, methods, and data of experimental psychology with that of human factors. The overall program is structured to prepare the student for further graduate study in experimental psychology or human factors at the Ph.D. level, and/or for a career as a research applied scientist in human factors psychology. The curriculum stresses integration of knowledge in three key areas:

1. the theoretical issues and quantitative research methodology associated with perception, human information processing, motor skills, and other psychological processes;
2. application of knowledge about basic psychological processes to the development of equipment, equipment interfaces, and work environments; and
3. the tools that the human factors specialist applies to system analysis, design, test, and evaluation.

Emphasis is on the integration of practical experience with course work and research. Students who choose the human factors track will meet the accreditation requirements of the Human Factors and Ergonomics Society, and receive credit toward Board Certification in Ergonomics or Human Factors. The human factors practicum is normally completed during the summer between the first and second years.

All students enrolled in any of the three programs leading to the Master of Arts with a major in Psychology are subject to the following general requirements of the Department of Psychology. Full-time students normally complete program requirements in two years:

1. The number of semester hours and required courses described below.
2. Demonstration of satisfactory progress toward the degree that includes the requirement that students maintain a minimum average of B (3.00) in coursework. Students who fail to meet this requirement are either placed on academic probation or dismissed from the program.
3. Students are permitted no more than six semester hours with grades of C or lower. Students who fail to meet this requirement are dismissed from the program.
4. No more than six semester hours of 400-level courses may apply toward the master's degree, and normally no more than six semester hours of graduate work approved by the department chair may be transferred from other institutions.
5. Attendance is required at regularly scheduled extra-course seminars on selected issues in psychology and at occasional specialized programs.
6. Thesis must deal with an approved research problem, incorporating an appropriate review of theory and literature, and demonstrating competence in the application of research methodology.
7. Students are expected to conduct themselves in a professional and ethical manner in accordance with generally accepted standards for psychologists. Failure to do so may result in dismissal.
8. It is the student's responsibility to know and to meet the requirements of the University and of the graduate program.

The Master of Arts with a major in psychology (experimental-human factors) requires 39 semester hours, including thesis, as specified below. Full-time students normally complete course requirements in two years.

		Sem. Hrs.
Experimental-Human Factors Psychology		**39**
Psychology Core Requirements		12
PSY 501	EXPERIMENTAL DESIGN AND STATISTICS I	3
PSY 502	EXPERIMENTAL DESIGN AND STATISTICS II	3
PSY 510	HISTORY & SYSTEMS	3
PSY 599	THESIS	3
Experimental-Human Factors Core Requirements		18
PSY 522	ADVANCED COGNITIVE PROCESSES	3
PSY 529	PERCEPTION	3
PSY 531	HUMAN FACTORS IN SYSTEM DEVELOPMENT	3
PSY 533	ENGINEERING PSYCHOLOGY	3

PSY 535	ERGONOMICS	3
PSY 539	HUMAN FACTORS PRACTICUM	3
Psychology Electives (see below)		9

Electives[1]

PSY 506[2]	SELECTED TOPICS IN ADVANCED RESEARCH METHODOLOGY	3
PSY 524	HUMAN INFORMATION PROCESSING	3
PSY 528	PSYCHOPHYSIOLOGY	3
PSY 532[2]	SPECIAL TOPICS IN HUMAN FACTORS	1 - 3
PSY 534	HUMAN COMPUTER INTERACTION	3
PSY 536	TRAINING SYSTEM DEVELOPMENT	3
PSY 537	TEAM AND GROUP PROCESS	3
PSY 596	EXPERIMENTAL RESEARCH	1 - 3
PSY 597	READINGS	1 - 3

[1]Courses may be selected from this list or, with permission of the program director, from other graduate courses within the department and from graduate courses/programs outside the department in such related disciplines as engineering or computer science. No more than six semester hours of courses taken outside the department may count toward program credit.

[2]PSY 506 and PSY 532 may be taken more than once for credit.

Master of Arts in General Psychology (PSY)

The Master of Arts in general psychology is designed to accommodate a variety of goals and is structured so that the student gains a basic understanding across a broad spectrum of psychology. The program prepares students for work at the doctoral level and affords the opportunity to develop skills which are viewed positively by prospective employers. The program features empirical research, conceptual analysis and critical methodology in perception, learning, memory, language, problem solving, decision making, developmental, personality and social psychology. A student takes a minimum of two courses in the areas of cognitive, developmental, and social psychology. With the six elective hours, it is also possible to take courses in clinical and human factors, or develop interdisciplinary interests in computer science, education, business, engineering, communication, or biology. The student can concentrate in a particular area of research by working with an individual faculty mentor.

All students enrolled in any of the three programs leading to the Master of Arts with a major in Psychology are subject to the following general requirements of the Department of Psychology.

1. The number of semester hours and required courses described below.
2. Demonstration of satisfactory progress toward the degree that includes the requirement that students maintain a minimum average of B (3.00) in coursework. Students who fail to meet this requirement are either placed on academic probation or dismissed from the program.
3. Students are permitted no more than six semester hours with grades of C or lower. Students who fail to meet this requirement are dismissed from the program.
4. No more than six semester hours of 400-level courses may apply toward the master's degree, and normally no more than six semester hours of graduate work approved by the department chair may be transferred from other institutions.
5. Attendance is required at regularly scheduled extra-course seminars on selected issues in psychology and at occasional specialized programs.
6. Thesis must deal with an approved research problem, incorporating an appropriate review of theory and literature, and demonstrating competence in the application of research methodology.
7. Students are expected to conduct themselves in a professional and ethical manner in accordance with generally accepted standards for psychologists. Failure to do so may result in dismissal.
8. It is the student's responsibility to know and to meet the requirements of the University and of the graduate program.

The Master of Arts with a major in psychology (general) requires 36 semester hours, including thesis, as specified below. Full-time students normally complete program requirements in two years.

Sem. Hrs.

General Psychology			**36**
Psychology Core Requirements			12
	PSY 501	EXPERIMENTAL DESIGN AND STATISTICS I	3
	PSY 502	EXPERIMENTAL DESIGN AND STATISTICS II	3
	PSY 510	HISTORY & SYSTEMS	3
	PSY 599	THESIS	3
General Psychology Requirements - 6 hours from each of the three content areas below[1]			18
Developmental Psychology Content Area			6
	PSY 457	TELEVISION AND ITS EFFECTS ON CHILDREN	3
	PSY 573	DEVELOPMENTAL PSYCHOLOGY	3
	PSY 574	COGNITIVE DEVELOPMENT IN CHILDREN	3
Cognitive Psychology Content Area			6
	PSY 522	ADVANCED COGNITIVE PROCESSES	3
	PSY 524	HUMAN INFORMATION PROCESSING	3
	PSY 529	PERCEPTION	3
Social Psychology Content Area			6
	PSY 444	ENVIRONMENTAL PSYCHOLOGY	3
	PSY 537	TEAM AND GROUP PROCESS	3
	PSY 585	EXPERIMENTAL SOCIAL PSYCHOLOGY	3
Electives[2]			6

[1] In special cases, a Readings (PSY 597) or another course in one of the content areas (e.g., PSY 588, Interpersonal Processes) may be substituted for one of the named courses.

[2] Six semester hours, some of which may be from other departments of the University, selected in consultation with the advisor.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.

PSY 444 ENVIRONMENTAL PSYCHOLOGY 3

Study of the effects of the physical and social environment on human behaviors, attitudes, and affective responses.
Prerequisite(s): (PSY 101, 341) or permission of instructor.

PSY 457 TELEVISION AND ITS EFFECTS ON CHILDREN 3

Readings in psychological research on the broad effects of television on children. Emphasis on analyzing and evaluating the research.
Prerequisite(s): PSY 101.

PSY 501 EXPERIMENTAL DESIGN AND STATISTICS I 3

Study of the logic of the design of experiments in psychology with special emphasis on the use of the analysis of variance. Students will be expected to perform statistical procedures on the computer using canned statistical packages.
Prerequisite(s): Undergraduate statistics.

PSY 502 EXPERIMENTAL DESIGN AND STATISTICS II 3

Further study of the logic of the design of experiments in psychology with special emphasis on the use of bivariate correlation and regression, and multiple regression. Students will be expected to perform statistical procedures on the computer using canned statistical packages.
Prerequisite(s): PSY 501.

PSY 506 SELECTED TOPICS IN ADVANCED RESEARCH METHODOLOGY 3

Study of special topics in statistics, research design, behavior research methods, and computer technology. The specific topic will vary from one offering to the next. Possible topics include applied multivariate statistics, questionnaire design, evaluation research methods, program evaluation, and performance measurement. May be repeated.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 510 HISTORY & SYSTEMS 3

An extensive survey of the theories and research paradigms that comprise the science of psychology. Topics include an historical overview of the field, the structure of the modern profession, and selected current areas of application and inquiry.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 522 ADVANCED COGNITIVE PROCESSES 3

Basic research paradigms for the experimental investigation of cognitive processes, with attention to the current information-processing theories of cognition. Topics include selective attention, visual short-term memory, pattern recognition, encoding processes, imagery, search and retrieval processes, theories of human memory, and cerebral dominance.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 524 HUMAN INFORMATION PROCESSING 3

Current psychological and artificial intelligence models of cognition. Topics include coding mechanisms in the central nervous system, simulation of sensory processes and recognition, computer models of human memory, semantic information processing by humans and machine, fast retrieval theories, recent theories of language comprehension and problem solving.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 528 PSYCHOPHYSIOLOGY 3

Neurophysiology of attention, sensation, perception, emotion, learning, memory, and motor control. Emphasis on electrophysiological indicants and cybernetical analyses.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 529 PERCEPTION 3

Systematic study of methods and research findings in the field of human perception, with an evaluation of theoretical interpretations.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 531 HUMAN FACTORS IN SYSTEM DEVELOPMENT 3

Introduction to human factors during the system development process. Treats the design process from initial conceptual stages to final testing and evaluation. Emphasis is upon methods and techniques that permit development of data to support human factors functions throughout the process.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 532 SPECIAL TOPICS IN HUMAN FACTORS 1 - 3

Wide ranging topics related to Human Factors Psychology are envisioned. For example: human tracking performance, tactual communication, vigilance, motor memory, skill development, visual displays, technical invention, electrophysiological indicants of human performance, etc. May be repeated.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 533 ENGINEERING PSYCHOLOGY 3

Treatment of the relationship between problems in human factors engineering and theory-based research in experimental psychology and human performance. Topics covered include theory and research in such areas as decision-making, attention, perception, and motor performance and their potential application to the design of the person-machine interface in complex systems.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 534 HUMAN COMPUTER INTERACTION 3

A critical review of human factors issues in the design of user interfaces of interactive computer systems. Emphasis will be placed on topics of cognitive engineering as they apply to user-centered systems design.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 535 ERGONOMICS 3

Ergonomics, the study of work, emphasizes the physical aspects, capabilities, and limitations of humans. Students participate in an anthropometric measurement laboratory, employ computerized biomechanical models, and examine the literature in a specific area of interest.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 536 TRAINING SYSTEM DEVELOPMENT 3

Treatment of the systems approach to training program analysis, design, and evaluation. Topics covered include assessment of training objectives, development of training program content, selection of training media, application of simulation technology, and program evaluation procedures, including transfer of training methodology.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 537 TEAM AND GROUP PROCESS 3

Study of group processes and theories with special application to team training, communication, performance, and coordination in human factors settings and problems. Group decision making and leadership are also emphasized.
Prerequisite(s): Graduate student status in psychology or permission of instructor.

PSY 539 HUMAN FACTORS PRACTICUM 3

Experience in applying the theory, methods, and data of experimental-human factors psychology to person-machine problems is acquired through placement in an approved human factors organization.
Prerequisite(s): (PSY 501, 524, 529, 531, 533) or permission of the director of the Experimental-Human Factors Program.

PSY 550 INTRODUCTION TO CLINICAL PSYCHOLOGY 3

Introduction to interviewing skills with adults and children. Academic and applied components include supervised practice interviews and documentation. Professional components addressed include diversity, ethics, and mental health systems.
Prerequisite(s): Graduate student status in clinical program.

PSY 551 ASSESSMENT OF INTELLIGENCE 3

Theoretical rationale and techniques of individual mental testing, with emphasis on the Wechsler Scales (WAIS, WISC, WPPSI) and the Stanford-Binet. Major content areas include theories of intelligence, relevant psychometric principles, clinical interpretation, and current research.
Prerequisite(s): Graduate student status in clinical program or permission of instructor.

PSY 553 THEORIES AND RESEARCH IN PSYCHOPATHOLOGY 3

Survey of mental disorders with respect to their characteristics, etiology, and treatment alternatives. Emphasis is on the process of expanding knowledge through research. Practice in the use of the current diagnostic classification system.
Prerequisite(s): Graduate student status in clinical program or permission of instructor.

PSY 555 THEORIES OF PERSONALITY AND PSYCHOTHERAPY 3

Survey and critical analysis of the major current theories of personality and psychotherapy, integrating their contributions into a diversified, functional, and adaptable approach to therapy.
Prerequisite(s): Graduate student status in clinical program or permission of instructor.

PSY 556 ASSESSMENT OF PERSONALITY 3

Survey of approaches to personality assessment as well as the techniques of administration and interpretation of specific instruments. Emphasis is on the MMPI-2, NEO-PIR, and MCMI-III. Strategies of test construction and evaluation, ethical issues, and research are discussed.
Prerequisite(s): (PSY 551, 553) or graduate student status in clinical program or permission of instructor.

PSY 558 GROUP PSYCHOTHERAPY 3

Survey of theories and techniques of group psychotherapy, including a review of the theoretical and empirical literature, as well as a training group experience.
Prerequisite(s): (PSY 555; graduate student status in clinical program) or permission of instructor.

PSY 560 CHILDHOOD PSYCHOPATHOLOGY AND PSYCHOTHERAPY 3

Current views of the etiology and differential diagnosis of psychopathological disorders of childhood and adolescence are examined. Relevant therapeutic approaches are presented and evaluated in relation to recent research.
Prerequisite(s): (PSY 553, 555; graduate student status in clinical program) or permission of instructor.

PSY 564 INDIVIDUAL PSYCHOTHERAPY 3

In-depth study of the principles and techniques of an integrated approach to individual psychotherapy (humanistic, dynamic, and cognitive-behavioral) as developed from clinical and empirical findings.
Prerequisite(s): (PSY 555; graduate student status in clinical program) or permission of instructor.

PSY 565 ETHICAL & CULTURAL ISSUES IN CLINICAL ASSESSMENT AND PSYCHOTHERAPY 3

An examination of ethical theories and principles applied to clinical assessment and psychotherapy. Issues addressed include ethical frameworks, ethical codes, assessment practices, psychotherapy techniques, and common problems arising in clinical practice.
Prerequisite(s): Graduate student status in clinical program or permission of instructor.

PSY 566 MARRIAGE AND FAMILY THERAPY 3

Survey of the major therapeutic approaches to family and marital problems and related research findings.
Prerequisite(s): (PSY 555; graduate student status in clinical program) or permission of instructor.

PSY 567 SPECIAL TOPICS IN CLINICAL PSYCHOLOGY 1 - 3

A variable topics course on issues relevant to the training of students preparing for work in clinical psychology. May be repeated with different topics.
Prerequisite(s): Graduate student status in clinical program or permission of instructor.

PSY 569 CLINICAL PRACTICUM 1

Experience in interviewing, psychological testing and therapy is acquired through placement in approved mental health agencies.
Prerequisite(s): Graduate student status in the clinical program.

PSY 573 DEVELOPMENTAL PSYCHOLOGY 3

The science of human development with emphasis on theory, research methods, findings and applications. Topics selected from but not limited to personality and social development, language acquisition, problem-solving, attachment, sex roles, children's rights, moral and prosocial behavior, family relations and extrafamilial influences such as television and schools.
Prerequisite(s): Graduate student status or permission of instructor.

PSY 574 COGNITIVE DEVELOPMENT IN CHILDREN 3

Major approaches to the study of cognitive development: attentional and mediational development as demonstrated in children's learning, memory, and problem solving; language development and Piaget's theory.
Prerequisite(s): PSY 452; (graduate status or permission of instructor).

PSY 585 EXPERIMENTAL SOCIAL PSYCHOLOGY 3

Designed to provide information and perspective about such social psychological topics as attitude change, interpersonal attraction, social influence, attribution, aggression, helping and intrinsic motivation.
Prerequisite(s): Graduate student status.

PSY 588 INTERPERSONAL PROCESSES 3

Seminar in research in some prominent sub-areas of social psychology. Emphasis on critical skills and research ideas in topics such as non-verbal communication, self-disclosure, affiliation and attraction, and equity theory.
Prerequisite(s): PSY 585 or permission of instructor.

PSY 595 SEMINAR IN SPECIAL TOPICS IN PSYCHOLOGY 1 - 3

Various topics of special interest to faculty and students. An intensive critical evaluation of the appropriate literature. May be repeated.
Prerequisite(s): Graduate student status or permission of instructor.

PSY 596 EXPERIMENTAL RESEARCH 1 - 3

Individual graduate students explore particular research areas. Under guidance of the instructor, research projects are formulated and conducted. Project reports are required. May be repeated.
Prerequisite(s): Permission of instructor.

PSY 597 READINGS 1 - 3

Designed for individual, student-faculty study in a specialized area of interest. Topic and criteria for evaluation to be specified prior to registration. May be repeated.
Prerequisite(s): Permission of instructor.

PSY 599 THESIS 3

An original research project incorporating an appropriate review of theory and literature and demonstrating competence in the application of research methodology. Required of all graduate students.

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the Bulletin
AUGUST 2006 - GRADUATE ISSUE
→ Explore a Different Issue

College of Arts and Sciences

(REL) Religious Studies (Collapse Description)

Sandra Yocum Mize, Chair of the Department
John A. McGrath, Director of Graduate Studies

The Department of Religious Studies offers two graduate programs leading to the Master of Arts: theological studies and pastoral ministry. A third program leads to the Doctor of Philosophy in theology. The distinctive research focus of the doctoral program is the practices/praxis of Catholicism as it is inculturated in multiple ways in the United States context. Master's and doctoral students join with their professors to form an ecumenical community that integrates the study of the classical disciplines of Christian theology with attentiveness to the multicultural and interdisciplinary dimensions critical to the contemporary study of religion. Intensive study of Roman Catholic traditions remains central to each graduate program. Both the master's and doctoral programs include basic requirements and allow students flexibility in the remainder of their course selection to ensure that their graduate studies serve their desired outcomes, whether in pursuing further academic work or securing placement in professional ministry.

Assistantships

Qualified applicants are eligible for financial assistance in the form of assistantships for master's students and assistantships or fellowships for doctoral students. Awards are determined on a competitive basis. Master's students receive tuition remission for 18 credit hours per year and an annual stipend. Doctoral students receive tuition remission for 18 to 30 credit hours per year and an annual stipend.

Advising

The director of graduate studies functions as the advisor for all incoming master's students. No later than the completion of the tenth semester hour of graduate credit, a student must formally choose an academic advisor from among the full-time religious studies faculty members who teach in the master's program or formally agree to have the director of graduate studies continue as her or his advisor.

The Ph.D. program director (or the director's designate) functions as the initial academic advisor for all Ph.D. students. The Ph.D. program director assists students in first semester course selection and provides initial guidance in scheduling general examinations and selecting the five members of the general examination committee. The Ph.D. program director reports on advising activities for each student to the Ph.D. committee once per semester.

Doctoral students also work with a five-member general examination committee. The committee must include a faculty member from each of the core disciplines: history of Christianity, biblical studies, and theology/ethics. The committee determines whether the student passes or fails the three general examinations.

As soon as doctoral students determine their dissertation topics, they should choose, in consultation with the Ph.D. program director, a dissertation director from among the religious studies faculty members who teach doctoral seminars. The doctoral student, with the dissertation director's guidance, chooses a qualifying examination/dissertation committee. In addition to the dissertation director, this committee ordinarily consists of three religious studies faculty members who teach doctoral seminars and one member outside the department. This committee determines whether the student passes or fails the qualifying examination and reads and evaluates the dissertation.

The composition of both examination committees is subject to the approval of the Ph.D. program director and the Ph.D. committee.

Facilities

Master's and doctoral students have access to distinctive University of Dayton resources such as the Center for Leadership and Community, the Center for Catholic Education,

and the Institute for Pastoral Initiatives. The Consortium of Higher Education in Religious Studies offers interaction with area seminaries and other institutions, interchange of facilities, sharing of library resources, cooperative innovative programming, and cross-registration. Students have access not only to a greater variety of courses but also opportunities for even more flexible construction of their degree programs.

The University of Dayton also houses the International Marian Research Institute which administers a doctoral program in Theology (S.T.D.) sponsored by the Pontifical Marianum University in Rome. Religious studies master's students may take courses in the Institute. Interested students should consult with the director of graduate studies for further information.

Programs (Collapse All)

Program Name

Doctorate of Philosophy in Theology (REL)

The Ph.D. in theology employs a unique approach to theological studies and research utilizing the methodologies associated with the academic study of religion, emphasizing strong interaction with the social sciences and humanities. The program's distinctive practice of integrating methodologies prepares students to work within a web of disciplines with theology at the center of research and writing. Using this integrative methodological approach, graduates are able to do theology that is rooted in discovering, analyzing, understanding, and proposing creative transformations in their current religious context, especially as found in the practices/praxis that reflect the United States Catholic experience.

Doctoral students must complete a minimum of 90 semester credit hours beyond the bachelor's degree. Up to 30 credit hours from an accredited master's program in theology or religious studies can be counted toward the 90-credit requirement. The Ph.D. program director, in consultation with the religious studies Ph.D. committee, determines the number of credits accepted.

All students must complete REL 600 or its equivalent. Between 12 and 30 semester credit hours can be earned as dissertation hours; additional dissertation hours will ordinarily not count toward the minimum of 90 semester credit hours for the Ph.D. Students select doctoral seminars or reading courses to complete the remainder of the 90 credits.

Each student must be in full-time residence; i.e., taking the load of a full-time student, for a minimum of one year before attempting the qualifying examination.

Comprehensive Examinations

Each student, during the course of the program, must successfully complete three general examinations and a qualifying examination.

1. The three GENERAL EXAMINATIONS approximate the master's level comprehensive examinations. A student is expected to demonstrate basic knowledge in three core disciplinary areas of theology: biblical studies, history of Christianity, and systematic theology and ethics. The examinations serve two purposes. First, they provide a student with the background necessary for teaching most college-level introductory courses. Second, they equip the student with the broad knowledge base necessary for skillful theological work. The chair of the examination committee in cooperation with the Ph.D. program director oversees the proper administration of the three exams. Each examination consists of a written component followed by an oral examination. Ordinarily, at least one examination must be completed before the student completes 36 hours beyond the bachelor's degree. Students must pass all three examinations before proceeding to the qualifying examination. The student may repeat any examination once. Failure to pass an examination on a second attempt terminates the student from the program. Students who took comparable exams in an accredited master's program may petition for the waiver of any or all of the general examinations. A petition is submitted to the Ph.D. program director who presents it to the religious studies Ph.D. committee. The committee makes the final determination.
2. Each student must pass a QUALIFYING EXAMINATION before beginning the dissertation. Ordinarily, the student must complete 54-60 semester hours beyond the bachelor's degree before attempting this examination. Through the qualifying examination, students demonstrate their ability to do original research in the field of the U.S. Catholic experience. It is, therefore, substantially more detailed and extensive than the three general examinations. The qualifying examination consists of three parts:
    1. a written examination on the U.S. Catholic experience broadly

conceived;
2. a completed dissertation prospectus covering the proposed dissertation area; and
3. an oral examination.

Upon successful completion of the written examination and submission of the prospectus, the student has an oral examination with her or his committee. The student must be prepared to respond to questions on the U.S. Catholic experience as well as her or his dissertation prospectus. The chair of the examination committee in cooperation with the Ph.D. program director oversees the proper administration of the exam. Upon successful completion of the qualifying examination, students are considered candidates for the doctoral degree. A student may repeat all or part of the qualifying examination once if needed; a second failure terminates the student from the program.

Research Skills

By the time a student has completed 54 hours in the program (including any hours accepted from other institutions), the student is expected to demonstrate a minimum of three research skills that will enable the student to do primary research in an area of the U.S. Catholic experience.

1. Latin: A basic ability to read official ecclesiastical texts in Latin is ordinarily expected of all students. Proficiency is demonstrated by successful completion of an appropriate course in Latin or by passing an examination consisting of translating a short specific text (e.g., a section of an encyclical) and accurately responding to content questions on another Latin text. The examination is to be completed within a defined time period, aided by a dictionary and grammar guide. A qualified religious studies faculty member administers the exam.
2. Research Languages: All students are expected to demonstrate at least reading proficiency in one modern language other than English. Proficiency is normally demonstrated by the successful completion of a test administered by a qualified faculty member in either the Department of Languages or Religious Studies. Depending upon the precise area of research, the student may be required to demonstrate a higher level of competency in the main research language. Students who have established proficiency in a language in another graduate program within the last five years may petition the religious studies Ph.D. committee to waive the language examination.
3. Additional Research Languages or Analytical Skills: Depending on her or his precise area of research, each student will be required to demonstrate proficiency in at least one additional research skill. For those whose research focuses on texts, that skill may be an additional language; for those whose research includes a significant component in biblical studies or classical theology, proficiency in biblical languages may be indicated; for those doing statistical or qualitative research, facility in an additional analytical area may be necessary (e.g., statistics, ethnography, participant-observation analysis, etc.). Successful completion of a graduate course in a given analytical skill serves as an acceptable indicator of a sufficient level of proficiency for future research purposes. The specific additional research skills (both languages and analytical) required for the student's program will be determined by the student's dissertation committee in consultation with the Ph.D. program director and religious studies Ph.D. committee. A student is notified in writing of specific research skills required of her or him.

Dissertation

The dissertation is a major research project in which the candidate demonstrates the ability to define a research question, develop a research plan, employ relevant research skills and methodologies, and conduct original theological research. The candidate, in close consultation with the dissertation director, determines the topic, methodologies, and pertinent resources. The research plan is outlined in the dissertation prospectus that is submitted as part of the qualifying examination. Passing the qualifying examination means that the prospectus is accepted. Candidates may apply no more than 30 semester hours of dissertation credit to the Ph.D. degree.

The student's dissertation director and committee will be constituted as described above. The dissertation is presented to the committee in a public defense no later than four weeks prior to graduation. The dissertation committee may accept the dissertation without revisions; with minor revisions to be reviewed by the dissertation director; with major revisions to be examined by the committee; or the committee may reject the dissertation (which requires the candidate to retake the dissertation area examination and proceed from that point, as above). Upon final acceptance of the dissertation, the candidate shall be awarded the Ph.D. degree.

Master of Arts in Pastoral Ministry (REL)

The master's program in pastoral ministry integrates the study of theology with the general principles and effective practices of pastoral ministry. The program offers students an opportunity to prepare for a variety of service careers emerging in the contemporary Church, including pastoral positions in catechetics and religious education, family, parish, and campus ministry. Courses in religious education and telecommunications, family and parish ministries, and the social teachings of the Church ensure the vitality of the program.

Program Requirements for the M.A.

This program requires 36 credit hours for graduation. The majority of the student's coursework must be taken in the Department of Religious Studies. A 3.0 grade point average in departmental courses and in the student's overall program is required for graduation.

Master's students in both theological studies and pastoral ministry are required to successfully complete the one-credit REL 500A, "Introduction to Research Methods in Religious Studies," the three two-credit courses: REL 500B, "Foundations of Biblical Studies," REL 500C, "Foundations of Church History and Historical Theology," REL 500D, "Foundations of Systematic and Moral Theology." Students may petition the religious studies graduate committee to waive from one to four of these requirements. The student must present clear evidence of equivalent coursework to that completed in REL 500A, B, C, or D for the requirement to be waived. Students must complete REL 500B prior to taking specialized biblical courses, REL 500C prior to taking specialized historical courses, and REL 500D prior to taking specialized systematic or moral theology courses. Each student must complete at least one additional two- or three-credit course in each of the four core disciplinary areas: biblical studies, historical studies, systematic theology and moral theology.

Upon completion of the basic requirements, students must then draw up a specific program proposal based upon the projected course rotation. The selection of courses is done in consultation with the student's academic advisor and in light of the student's needs, interests, and background. This program proposal is submitted to the director of graduate studies for approval.

The programs leading to the master's degree may be pursued in summer sessions with courses of one to three weeks duration, or be pursued full-time; i.e., throughout the year. The master's degree must be completed seven calendar years from the time of matriculation.

Structure of the Master's Program and Coursework

This program is divided into three parts:

1. Theological foundations (12 to 15 hours including the seven required credits);
2. Basic principles for effective ministry (six to nine hours); and
3. The practice and study of specific ministries (9 - 12 hours), including a practicum (3 hours) and the required pastoral ministry seminar (no credit).

Language Proficiency

There is no language requirement for the master's degree. For specialization in the biblical or historical areas, a working knowledge of the language employed in the area, e.g., Hebrew, Greek, or Latin, is encouraged. Students preparing for doctoral work should work toward proficiency in at least one modern language.

Master of Arts in Theological Studies (REL)

The master's program in theological studies offers a comprehensive approach to the study of theology and religion. Each student is expected to develop an understanding of biblical sources, historical developments in Christianity, and contemporary systematic and moral theologies, especially in the Roman Catholic tradition. Ecumenical perspectives among Christians and interfaith dialogue among the world religions provide another important matrix for study.

Concentration in Marian Studies

A concentration in Marian Studies is available for students who take between 12 and 16 semester credits in specially designated courses listed under the Marian studies concentration. The International Marian Research Institute at the University of Dayton offers these courses on a regular basis. All graduate students have access to the world-renowned resources of the Marian Library for their research.

Program Requirements for the M.A.

This program requires 36 credit hours for graduation. The majority of the student's coursework must be taken in the Department of Religious Studies. A 3.0 grade point average in departmental courses and in the student's overall program is required for graduation.

Master's students in both theological studies and pastoral ministry are required to successfully complete the one-credit REL 500A, "Introduction to Research Methods in Religious Studies," the three two-credit courses: REL 500B, "Foundations of Biblical Studies," REL 500C, "Foundations of Church History and Historical Theology," REL 500D, "Foundations of Systematic and Moral Theology." Students may petition the religious studies graduate committee to waive from one to four of these requirements. The student must present clear evidence of equivalent coursework to that completed in REL 500A, B, C, or D for the requirement to be waived. Students must complete REL 500B prior to taking specialized biblical courses, REL 500C prior to taking specialized historical courses, and REL 500D prior to taking specialized systematic or moral theology courses. Each student must complete at least one additional two- or three-credit course in each of the four core disciplinary areas: biblical studies, historical studies, systematic theology and moral theology.

Upon completion of the basic requirements, students must then draw up a specific program proposal based upon the projected course rotation. The selection of courses is done in consultation with the student's academic advisor and in light of the student's needs, interests, and background. This program proposal is submitted to the director of graduate studies for approval.

The programs leading to the master's degree may be pursued in summer sessions with courses of one to three weeks duration, or be pursued full-time; i.e., throughout the year. The master's degree must be completed seven calendar years from the time of matriculation.

Structure of the Master's Programs and Coursework

Three arrangements are possible:

1. 36 hours of coursework (including the seven required credits) plus submission of a research paper (completed in a course taken between the 15th and 24th hours of coursework) to the director of graduate studies;
2. 33 hours of coursework (including the seven required credits) plus a three-hour comprehensive project with an oral defense; or
3. 30 hours of coursework (including the seven required credits) plus a 6-hour thesis with an oral defense.

Language Proficiency

There is no language requirement for the master's degree. For specialization in the biblical or historical areas, a working knowledge of the language employed in the area, e.g., Hebrew, Greek, or Latin, is encouraged. Students preparing for doctoral work should work toward proficiency in at least one modern language.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
REL 500A	INTRODUCTION TO RESEARCH METHODS IN RELIGIOUS STUDIES	1

This required course introduces students to the methods and tools of research and writing in theology.

Code	Title	Sem. Hrs.
REL 500B	FOUNDATIONS OF BIBLICAL STUDIES	2

This required course focuses on critical reading and discussion of representative texts from the field of biblical studies to introduce content and methods at a master's level. Passing a final examination completes the requirement.

REL 500C FOUNDATIONS OF CHURCH HISTORY AND HISTORICAL THEOLOGY 2

This required course focuses on critical reading and discussion of representative texts from the related fields of church history and historical theology to introduce content and methods at a master's level. Passing a final examination completes the requirement.

REL 500D FOUNDATIONS OF SYSTEMATIC AND MORAL THEOLOGY 2

This required course focuses on critical reading and discussion of representative texts from the related fields of systematic and moral theology to introduce content and methods at a master's level. Passing a final examination completes the requirement.

REL 501 BIBLICAL HEBREW I 3

Introduction to the morphology and syntax of biblical Hebrew to facilitate the handling of basic tools and the reading of simple prose texts.

REL 502 BIBLICAL GREEK I 3

Introduction to Hellenistic Greek. Vocabulary, grammar, and syntax. Selective readings of New Testament texts.

REL 503 BIBLICAL HEBREW II 3

Introduction to the morphology and syntax of biblical Hebrew to facilitate the handling of basic tools and the reading of simple prose texts.

REL 504 BIBLICAL GREEK II 3

Introduction to Hellenistic Greek. Vocabulary, grammar, and syntax. Selective readings of New Testament texts.

REL 511 CONTEMPORARY BIBLICAL CRITICISM 2 - 3

Introduction to the principal methodological approaches to the Hebrew Bible and New Testament, with an emphasis on introductory matters, content, and cultural heritage. Will include a survey of the major results of contemporary biblical scholarship.

REL 513 OLD TESTAMENT EXEGESIS 2 - 3

Critical study of selected writings of the Old Testament. (1) Pentateuch, (2) Historical Books, (3) Prophets, (4) Psalms, (5). Wisdom Literature, (6) Apocalyptic Literature.

REL 518 NEW TESTAMENT EXEGESIS 2 - 3

Critical exegetical study of selected writings of the New Testament. (I) Synoptics: Matthew and Mark, (2) Luke/Acts, (3) John, (4) Pauline Corpus, (5) Pastoral Epistles, (6) Book of Revelation.

REL 519 NEW TESTAMENT THEOLOGY 2 - 3

A thorough study of one theme in the theology of the New Testament. May be taken more than once.

REL 520 HISTORY AND THEOLOGY OF THE MEDIEVAL CHURCH 2 - 3

Early Medieval foundations, the Carolingian Renaissance, the preparation of the 11th and 12th centuries, as well as the post-13th century movement toward nominalism, to give perspective to the High Scholasticism of the 13th century.

REL 521 CHRISTIANITY IN THE LATE ANTIQUITY 2 - 3

The development of doctrine from the post-apostolic age to the beginning of the Middle Age including the Apostolic Fathers, the Apologists, Gnosticism, Irenaeus, Marcion, Tertullian, John of Damascus, and the Schools of Antioch, Alexandria, and Cappadocia.

REL 522 AUGUSTINE TO OCCAM 2 - 3

Analysis of the life and thought of individual leaders of the Church.

REL 523 TRENT TO VATICAN II 2 - 3

Historical account of Christianity's theological response to the major reformers and of further theological developments of Christianity in the context of philosophy, science, and political revolutions up to Vatican II.

REL 524 PROTESTANT CHRISTIANITY 2 - 3

Survey of the development of Protestant thought from the Reformation to the present. Analysis, in their own writings and historical context, of selected Protestant theologians, such as Luther, Calvin, Knox, Cranmer, Schleiermacher, Ritschl, Harnack, and Barth.

REL 525 AUGUSTINE 2 - 3

The life and work of Augustine of Hippo (354-430), a major theologian of Wstern Christianity, whose influence in both Protestant and Catholic traditions includes sexual ethics, church-state relations, Trinitarian and sacramental theology.

REL 528 U.S. CATHOLICISM 2 - 3

Examination of the experiences and contributions of the people who formed the Catholic Church in the United States. A focus on the influence of Catholicism on American culture, politics, intellectual life, education, and religion and an investigation of how Catholic faith has informed the attitudes and actions of U.S. Catholics regarding culture, politics and social justice. Topics include religious liberty, lay movements in the U.S., anti-Catholicism, contributions of U.S. Catholic women, African American Catholics, and Hispanic/Latino[a] Catholics.

REL 529 AFRICAN AMERICAN RELIGION 2 - 3

Investigation of how religion has shaped African American identity, culture and community. Addresses the religious experience of African Americans through their theology, literature, music, history, and creative arts in the forms of the slave narratives, the spirituals and Gospel music, black homiletics, and other writings.

REL 535 GOD AND HUMAN EXPERIENCE 2 - 3

A survey of Christian theologies of God, traditional and modern, and the viewpoints they represent on the nature and purpose of human existence.

REL 537 CHRISTOLOGY 2 - 3

An examination of the approaches taken by contemporary theologians in discussing Jesus and his significance for Christian faith.

REL 540 ECCLESIOLOGY 2 - 3

Study of the nature and mission of the church, with an emphasis on Catholic perspectives. Topics include the church as mystery, models of the church, ecumenism, authority, laity, and the church-world relationship.

REL 543 SACRAMENTAL THEOLOGY 2 - 3

Detailed study of the principle of sacramentality and of the individual sacraments, stressing the historical development of each and its contemporary renewal.

REL 544 SELECTED CATHOLIC DOCTRINES 2 - 3

An examination from several perspectives (biblical, historical, and systematic) of Catholic doctrines and dogmas, including the notion of dogma, its development, Scripture and Tradition, Papal Infallibility, Freedom of Conscience, the Marian Dogmas, and the Salvation of non-Christians.

REL 545 CONTEMPORARY THEOLOGIANS 2 - 3

An examination of several contemporary approaches to theological method. Beginning with an overview of revolutionary challenges to theology in the nineteenth century, the course will examine the lives and contributions of such influential and diverse religious thinkers as Lonergan, Gutierrez, Ruether, Schillebeeckx, Rahner, and Kung and explore Feminist, Latin American, Asian, and African theologies.

REL 546 LITURGY 2 - 3

Study of the theological perspective on the history and the future of Christian liturgy.

REL 547 THEOLOGY OF CHRISTIAN DISCIPLESHIP 2 - 3

An examination of the meaning of Christian discipleship in light of the Scriptures and contemporary theological insights. Emphasis on the baptismal roots of the call to Christian holiness and the principal dimensions of this call.

REL 548 THEOLOGY OF PRAYER 2 - 3

Study of the meaning of prayer, focusing on prayer in the Hebrew and Christian Scriptures, prayer as reflected in selected classical mystical writers, and contemporary approaches to prayer.

REL 549 AQUINAS 2 - 3

Theology of Aquinas including Trinity, human nature, providence, grace, virtue, Christ, and sacraments with attention to historical context and contemporary interpretation. Main focus is study of the Summa.

REL 550 FEMINIST THEOLOGY 2 - 3

An examination of the emergence and development of feminist theology (a form of liberation theology), the nature of its discourse and methodology, and the ways in which feminist insights are transforming the study of scriptures, systematic theology, spirituality, and church history. The interfaith character of religious feminism will also be studied.

REL 551 THEOLOGY AND WORLD RELIGIONS 2 - 3

An examination of the reality, challenges, and opportunities confronting faith communities in our multicultural and religiously pluralistic societies. Students explore the spiritual resources of several of the world's religions, the ways in which these religions view one another, and the impact of interreligious dialogue and collaboration on the development of Christian theology today.

REL 561 APPROACHES TO MORALITY 2 - 3

An attempt to establish the foundations of Christian morality, consisting of an historical survey of approaches and developments from the New Testament period to the present.

REL 562 CONTEMPORARY MORAL PROBLEMS 2 - 3

An open approach to contemporary moral issues within theological perspectives.

REL 571 MARY AND THE NEW TESTAMENT 2

Study of the principal New Testament texts with reference to Mary as Mother of the Redeemer, as figure of the Church, and with reference to her role in the history of salvation.

REL 572 MARY - PATRISTIC PERIOD 2

Initial development of Marian doctrine and devotion in Greek, Latin, and Oriental patristics (first six centuries).

REL 573 MARY - MEDIEVAL PERIOD 2

Study of the development of Mariology from the 7th century to the Renaissance: Marian doctrines, Marian devotions, Mary in art and liturgy, Marian feasts, and principal Marian works.

REL 574 MARY - MODERN PERIOD 2

Study of the development of Mariology from the Renaissance to the 20th century: principal Marian questions/controversies, Marian devotions, Marian shrines, Mary in art and liturgy, Marian feasts, and principal Marian works.

REL 575 MARY - CONTEMPORARY PERIOD 2

Study of the teaching of Vatican II about the Blessed Virgin Mary, especially in chapter VIII of LUMEN GENTIUM and its implications and developments in contemporary Marian doctrine and devotion. Recent encyclicals on Mary.

REL 576 MARIAN DOCTRINE 2

Historical and theological study of principal Marian doctrines: Divine maternity, virginity, Immaculate Conception, and Assumption. Study of the question of Mary's spiritual maternity, intercession, and mediation.

REL 577 MARIAN SPIRITUALITY 2

Study of the spirituality of Mary; e.g., Mary and the Holy Spirit; Mary's virtues; Mary as first disciple of the Lord, as Servant of the Lord, and as model of the Church.

REL 578 SPECIAL MARIAN TOPICS 2

A study of issues and subjects pertinent to Mariology.

REL 579 IMRI DIRECTED STUDY 1 - 3

Courses studying, analyzing, or investigating a specific area of Mariology.

REL 580 THEOLOGY OF MINISTRY 2 - 3

Study of ministry as the right and responsibility of all Christians; Jesus' dying and rising as the unifying thread linking the description, division, and chief aspects of ministry to evangelization and the kingdom; pastoral implications of the foregoing.

REL 581 PASTORAL MINISTRY SEMINAR 0

Study of the practices critical for ongoing development as a minister with a focus on engaging in theoretical reflections. Those seeking the pastoral ministry degree are required to enroll at least four times during their course of studies.

REL 582 INTRODUCTION TO SPIRITUAL DIRECTION AND PASTORAL CARE 3 - 4

Introduction to the basic principles and practices of spiritual direction and pastoral care for those working in various pastoral settings, including parishes and health care facilities.

REL 583 RELIGIOUS PSYCHOLOGY 2 - 3

Study of the human response to God in the light of contemporary psychology. The implications for catechesis in the various stages of human development, in the process of conversion and commitment, and in the crises of faith.

REL 584 INTRODUCTION TO CANNON LAW 1 - 3

Study of those sections of cannon law especially relevant to the lay ecclesial minister serving in a Roman Catholic context. Required of those seeking the pastoral ministry degree.

REL 585 PASTORAL COUNSELING 2 - 3

Brief study of the methods of counseling with emphasis on those modes most in practice today. Concentration on the major problems faced by counselors in the pastoral area.

REL 586 LEADERSHIP IN PARISH MINISTRY 2 - 3

Study of the traditional parish structure as seen against the background of biblical and historical perspectives on the local church. An examination of the forces for change in the contemporary parish with an effort, out of the theoretical framework of leadership and administration, to assist the student in developing a philosophy and strategy of leadership.

REL 588 TEACHING MORALS AND VALUES IN RELIGIOUS EDUCATION 2 - 3

An integration of theory and practical techniques for teaching morals and values in religious education today. An exploration of value and moral development with emphasis on authors such as Piaget, Kohlberg, Erikson, Fowler, and Rokeach. May be repeated for graduate credit when topic changes.

REL 589 PRACTICUM 3 - 6

Approved supervised pastoral involvement coupled with theological reflections.

REL 590 SELECTED QUESTIONS 1 - 3

A study of specific questions and developments in biblical, historical, systematic, or catechetical theology.

REL 591 SPECIAL TOPICS 1 - 6

A graduate workshop and/or seminar investigating and analyzing a specific area of theology and interdisciplinary scholarship concerning contemporary issues.

REL 592 CONTEMPORARY ISSUES 1 - 6

Study of issues and subjects pertinent to theological studies and pastoral ministry.

REL 593 DIRECTED STUDY 1 - 3

A directed study of a particular theologian, problem, or historical period.

REL 598 COMPREHENSIVE PROJECT 3

REL 599 THESIS 6

REL 600 SEMINAR IN THEOLOGICAL RESEARCH METHODS 6

This two-semester course investigates methods and practice in contemporary theological research. Required of all entering doctoral students; open with permission to advanced master's students.

REL 620 SEMINAR - U.S. CATHOLIC EXPERIENCE IN HISTORICAL PERSPECTIVE 3

Examinations of the complex interactions between European-formed, medieval and post-Tridentine Catholic spiritualities, theologies and communities, in the early contact period with indigenous cultures and the later U.S. national context. A focus upon specific people, movements, thought, practices, and institutions prior to Vatican II will provide the content for considering enduring influences or decisive moments in shaping the contemporary U.S. Catholic experience. The seminars consider social, cultural, economic, political as well as the religious and theological influences that comprise the multiplicity of the U.S. Catholic experience.

REL 640 SEMINAR - THE U.S. CHURCH AND THE GLOBAL CHURCH 3

Examinations of relationships between the U.S. Catholic Church and particularly the churches outside Western Europe. Foci may include theological influences, the ethics of political and economic ties of the U.S. to other nations, communication, and communication theory.

REL 645 SEMINAR - U.S. CATHOLIC EXPERIENCE IN THEOLOGICAL PERSPECTIVE 3

Examinations of the complex interaction between U.S. Catholic experience and theologies after Vatican II and social, cultural, economic, and political movements which influence and are influenced by contemporary theologies. Foci may include specific people, movements (e.g., ecumenism, feminism, ecological issues, multi-culturalism, restorationism, etc.), theologies, practices, or institutions.

REL 660 SEMINAR - ETHICS, PRACTICE, AND CONTEMPORARY SOCIETY 3

Examinations of specific foundational or applied questions in contemporary Christian ethics, especially in patterns of communal practices such as evangelization, catechesis, liturgy, etc. Issues with particular relevance for North America will be the focus of research in these seminars. Differing perspectives from diverse methodological traditions will be highlighted.

REL 670 SEMINAR - RELIGION IN A PLURIFORM SOCIETY 3

Examinations of how religion functions in a diverse society, drawing upon the social sciences. Foci can include the personal search for meaning, concern for the commonweal, church-state relations, the family, studies of specific religious practices or local communities, the influence of social location (e.g., race, class, gender) on religious experience.

REL 697 DIRECTED READINGS 1 - 3

Designed for individual, student-faculty study in a specialized area of interest. Topic and criteria for evaluation to be specified prior to registration. Students may take no more than two directed readings per term.

REL 699 DISSERTATION 3 - 12

Research for an original research project for the doctoral degree, incorporating an appropriate review of theory and literature and demonstrating competence in the application of research methodology.

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School of Education and Allied Professions

(EDT) Teacher Education (Collapse Description)

Kathryn Kinnucan-Welsch, Chair of the Department

The mission of the Department of Teacher Education is the development of reflective, competent, and humane teachers. Recognizing the value of balancing theory and practice in professional education, the department provides candidates and faculty with the opportunity to be of service and to do research in P-12 settings. It dedicates itself to the discovery, construction, and development of the knowledge, skills, and dispositions that enable teachers to become educational leaders. The goal is to be a center of excellence in teacher education, thereby supporting continuing professional development and advocacy within the profession of teaching.

Students pursuing graduate work in the Department of Teacher Education have two options.

1. For those persons who are already licensed and wish to extend their knowledge, skills, and dispositions in a specialized field, the department offers several concentrations, identified by the admission code MSE. These concentrations include art education (MSE.EAR), interdisciplinary educational studies (MSE. EIP), literacy (MSE.ERE), music education (MSE.EUS), technology-enhanced learning (MSE.TEC), teacher as leader (MSE.ETL).

2. For those persons seeking licensure information, please see the section labeled "Licensure Requirements."
All students completing the Master of Science in Education must complete a minimum of 30 semester hours including the following core requirements.

Core Requirements

EDT 500	MODELS OF TEACHING
EDT 502 or EDT 503	PHILOSOPHICAL STUDIES IN EDUCATION (EDT 502) HISTORY OF EDUCATION IN THE UNITED STATES (EDT 503)
EDT 660	INTRODUCTION TO EDUCATIONAL RESEARCH

Licensure Requirements

For those persons who have an undergraduate degree in a field other than education, the Department of Teacher Education offers programs leading to teacher licensure at the graduate level, identified by the admission code LIC. These licensure programs include early childhood education (LIC.ECE), middle childhood education (LIC.EMS), adolescence to young adult education (LIC.EYA), multiage education (LIC.EAG), and intervention specialist (LIC.EIS). Candidates who complete the requirements for licensure may choose to complete the core requirements for the master's degree, but it is not mandatory. Although candidates typically complete licensure prior to completing the master's degree, the coursework may be taken concurrently. If the candidate does wish to pursue the master's degree after completing the requirements for licensure, application to the appropriate master's degree program must be made.

In addition to the coursework required for the various licensure programs, the State of Ohio requires candidates to pass Praxis II Exams as a condition for provisional licensure. Praxis requirements are specific to each licensure program. See advisor for details. Under the new licensure rules for the State of Ohio, entry year teachers must pass Praxis III during the two-year provisional license period.
If candidates have student teaching as part of their program, they must apply for an assignment in the term prior to the student teaching term and must have satisfied all prerequisites and program requirements. Credit earned for student teaching does not apply to a master's degree program. Candidates must meet the approved reading requirements to qualify for the professional license.

The Department of Teacher Education also offers endorsement programs that can be added to an existing license or certificate. These programs are identified by the admission code END, and include reading endorsement (END.ERE), computer/technology endorsement (END.TEC), middle childhood generalist endorsement (END.EMS.GEN), prekindergarten special needs endorsement (END.ECE.PSN).

*EDT 662 and EDT 663 must be taken in consecutive terms.

Programs (Collapse All)

Program Name

Adolescence to Young Adult Education (LIC.EYA and MSE.EYA) (EDT)

Completion of the program requirements for adolescence to young adult education leads to provisional licensure in the State of Ohio for grades 7 - 12. Candidates must complete approved licensure program coursework in one of the following teaching concentration areas: earth sciences, integrated language arts, integrated mathematics, integrated science, integrated social studies, life sciences, and physical sciences. Concentration requirements also include professional education coursework. Candidates must pass the required PRAXIS II specialty area exam(s) prior to EDT 509 and the clinical experiences. Candidates must also pass the PRAXIS II Principles of Learning and Teaching prior to licensure.
Candidates may choose to complete the master's degree after completing the requirements for licensure by completing the core requirements for the master's degree. Student teaching hours will not count toward the 30 semester hour requirement for a master's degree.

Adolescence to Young Adult Education

		Sem. Hrs.
Professional Education Requirements		
EDT 502 or 503	PHILOSOPHICAL STUDIES IN EDUCATION (EDT 502) HISTORY OF EDUCATION IN THE UNITED STATES (EDT 503)	3
EDT 507	THE PROFESSION OF TEACHING	2
EDT 507L	PROFESSION OF TEACHING LAB	1
EDT 508	THEORIES OF LEARNING AND HUMAN DEVELOPMENT	3
EDT 509	INSTRUCTION, MANAGEMENT, AND ASSESSMENT	3
EDT 570	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
EDT 602	CRITICAL READING IN THE CONTENT AREAS	3
Methods Courses		
EDT 550	INTEGRATED LANGUAGE ARTS METHODS FOR ADOLESCENT TO YOUNG ADULT	3
EDT 551	INTEGRATED SOCIAL STUDIES METHODS FOR ADOLESCENT TO YOUNG ADULT	3
EDT 553	MATH METHODS FOR ADOLESCENT TO YOUNG ADULT	3
EDT 554	SCIENCE METHODS FOR ADOLESCENT TO YOUNG ADULT	3
EDT 569	STUDENT TEACHING - ADOLESCENT TO YOUNG ADULT	3 - 7

Computer Technology Endorsement (END.TEC) (EDT)

The State of Ohio Computer Technology Endorsement can be added only to an existing standard teaching certificate/license. The endorsement is for grades K-12. To obtain the Computer Technology Endorsement candidates must take the following 18 hours of coursework:

		Sem. Hrs.
Program Requirements		
EDT 629	COGNITION, LEARNING AND TECHNOLOGY	3
EDT 630	MULTIMEDIA PRODUCTION	3
EDT 631	PLANNING AND ASSESSING TECHNOLOGY ENHANCED LEARNING	3
EDT 632	DISTANCE EDUCATION IN A DIGITAL AGE	3
EDT 633	WEB DESIGN AND DEVELOPMENT	3
EDT 634	BECOMING AN EFFECTIVE BUILDING TECHNOLOGY LEADER	3

Early Childhood Education (LIC.ECE and MSE.ECE) (EDT)

This graduate program, designed to prepare individuals who seek to work with young children and their families, leads to a Master of Science in education with a specialization in Transdisciplinary Early Childhood Education as well as the two Ohio Department of Education teaching licenses listed below. Coursework leading to the Pre-kindergarten Special Needs Endorsement is also available. It is also possible to meet the requirements for the Early Intervention Certificate awarded by the Ohio Department of Health and Human Services, Bureau of Early Intervention, in conjunction with the Ohio Department of Mental Retardation and Developmental Disabilities.

The Transdisciplinary Early Childhood Program is a "unified" concentration meaning that special education and regular education coursework is blended and cannot be separated. Candidates must pass appropriate PRAXIS exams prior to licensure. Student teaching hours will not count toward the 30 semester hour requirement for a master's degree.

Early Childhood License (LIC.ECE)
Valid for teaching children who are typically-developing, at-risk, gifted, and who have mild to moderate educational needs. Licenses are issued for ages three through eight (prekindergarten through grade three).

Early Intervention Specialist License (LIC.ECE.EIS)
Valid for teaching children who have mild, moderate to intensive educational needs, including service coordination. Licenses are issued for ages three through eight (pre-kindergarten through grade three).

Pre-Kindergarten Special Needs Endorsement (END.ECE.PSN)
Formally the Early Education of the Handicapped Validation (VAL.ECE.EEH). Valid teaching children ages 3-5 who have mild, moderate, to intensive needs. Must be attached to pre-kindergarten, certificate, a special education certificate, or a intervention specialist, or early childhood license.

Early Intervention Certificate (CER.ECE.EIC)
Valid for servicing infants and toddlers, ages birth through two, who have an identified developmental delay or who are at risk for developing such a delay. The young child is served within the context of its family.

		Sem. Hrs.
Prerequisites/Co-requisites Coursework[1]		
EDT 507	THE PROFESSION OF TEACHING	2
EDT 507L	PROFESSION OF TEACHING LAB	1
EDT 508[2]	THEORIES OF LEARNING AND HUMAN DEVELOPMENT	3
EDT 509	INSTRUCTION, MANAGEMENT, AND ASSESSMENT	3
EDT 518	INTEGRATED CURRICULUM AND INSTRUCTION FOR KINDERGARTEN-PRIMARY GRADES	4
EDT 527[3]	STUDENT TEACHING K-PRIMARY	3 - 7
EDT 570[2]	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
EDT 571[2]	LANGUAGE DEVELOPMENT AND EMERGENT LITERACY	3
EDT 600	READING METHODS	3
EDT 601	PHONICS, SPELLING, AND VOCABULARY	3
EDT 602	CRITICAL READING IN THE CONTENT AREAS	3
EDT 603	FOUNDATIONS OF LITERACY THROUGH LITERATURE	3
Cohort Group Coursework[4]		
EDT 510	INTRODUCTION TO TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION	2
EDT 511	INTEGRATED CURRICULUM FOR YOUNG CHILDREN	2
EDT 512	SUMMER PLAY INSTITUTE	2
EDT 513	DEVELOPMENTALLY AND INDIVIDUALLY APPROPRIATE PRACTICE	3
EDT 516	COLLABORATIVE ASSESSMENT BIRTH TO AGE 8	3
EDT 517[5]	EARLY CHILDHOOD SEMINAR ON MEDICAL AND HEALTH ISSUES	2
EDT 528	INTERNSHIP IN TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION (Ages 3-5)	3
EDT 573	COLLABORATING WITH FAMILIES, PROFESSIONALS, AND AGENCIES	3
EDT 610[7]	ADVANCED STUDY IN READING/LANGUAGE ARTS (PK-PRIMARY)	3

Pre-Kindergarten Special Needs Endorsment

Pre-requisites/Co-requisite Coursework

EDT 508[2]	THEORIES OF LEARNING AND HUMAN DEVELOPMENT	3
EDT 509	INSTRUCTION, MANAGEMENT, AND ASSESSMENT	3
EDT 570[2]	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
EDT 571	LANGUAGE DEVELOPMENT AND EMERGENT LITERACY	3
Coursework		
EDT 510	INTRODUCTION TO TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION	2
EDT 511	INTEGRATED CURRICULUM FOR YOUNG CHILDREN	2
EDT 512	SUMMER PLAY INSTITUTE	2
EDT 513	DEVELOPMENTALLY AND INDIVIDUALLY APPROPRIATE PRACTICE	3
EDT 516	COLLABORATIVE ASSESSMENT BIRTH TO AGE 8	3
EDT 517[5]	EARLY CHILDHOOD SEMINAR ON MEDICAL AND HEALTH ISSUES	2
EDT 528	INTERNSHIP IN TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION (Ages 3-5)	3
EDT 573	COLLABORATING WITH FAMILIES, PROFESSIONALS, AND AGENCIES	3

Early Intervention Certification

Prerequisites/Co-requisites Coursework

EDT 508	THEORIES OF LEARNING AND HUMAN DEVELOPMENT	3
EDT 570	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
EDT 571	LANGUAGE DEVELOPMENT AND EMERGENT LITERACY	3
Coursework[6]		
EDT 510	INTRODUCTION TO TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION	2
EDT 511	INTEGRATED CURRICULUM FOR YOUNG CHILDREN	2
EDT 512	SUMMER PLAY INSTITUTE	2
EDT 514	CURRICULUM AND INSTRUCTION FOR INFANTS AND TODDLERS WITH SPECIAL NEEDS	3
EDT 516	COLLABORATIVE ASSESSMENT BIRTH TO AGE 8	3
EDT 517	EARLY CHILDHOOD SEMINAR ON MEDICAL AND HEALTH ISSUES	2
EDT 529	INTERNSHIP IN EARLY INTERVENTION (Birth to Age 3)	3
EDT 573	COLLABORATING WITH FAMILIES, PROFESSIONALS, AND AGENCIES	3

[1] To be eligible for either the Early Childhood or the Early Intervention Specialist licenses, 16 hours of the following coursework must be satisfied (undergraduate or graduate), before beginning coursework in a Cohort Group. The remaining courses can be taken as co-requisites during the Cohort Group coursework.

[2] If not previously completed, these courses must be taken during the first three terms of coursework. EDT 508 and 570 must have been taken within the past five years. Evidence of 300 field hours must be provided.

[3] EDT 527 may be taken later in the program during the same term as EDT 528.

[4] Professional Education Requirements for the Early Childhood License and Early Intervention Specialist License.

[5] EDT 517 is required only for Early Intervention Specialist License.

[6] To be eligible for the Early Intervention Certificate from MR/DD the following coursework must be satisfied as a part of the cohort group.

[7] Only required for students who have not taken EDT 600 and 600L, 601,602,or 603

Intervention Specialist Mild/Moderate (LIC.EIS.EMM and MSE.EIS.EMM) (EDT)

Completion of this program leads to a license in Intervention Specialist Mild/Moderate. This program is for individuals wishing to teach students with mild/moderate disabilities (learning disabilities, mild cognitive disabilities, and emotional disturbance). Candidates must pass the PRAXIS II specialty area exam prior to Intervention Specialist licensure. Candidates may choose to complete the Master's Degree after completing the requirements for licensure by completing the core requirements for the master's degree. Student teaching hours will not count toward the 30 semester hour requirement for a master's degree.

Prerequisites

Teaching certificate/license and the following co-requisites:

Twelve semester hours in the teaching of Reading:

EDT 600	Reading Methods	3
EDT 600L	Reading Methods Lab	0

EDT 450/601	Phonics, Spelling, and Vocabulary	3
EDT 452/602	Critical Reading in Content Areas	3
EDT 350/603	Foundations of Literacy Through Literature	3

1. Teachers holding an Adolescence to Young Adult, Middle School or Secondary License must have coursework in Language Development (EDT 571).

		Sem. Hrs.
Professional Education Requirements		
EDT 570	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
EDT 572	INTRODUCTION TO EDUCATION OF LEARNERS WITH MILD/MODERATE NEEDS	3
EDT 573	COLLABORATING WITH FAMILIES, PROFESSIONALS, AND AGENCIES	3
EDT 574	BEHAVIOR MANAGEMENT	3
EDT 575	ASSESSMENT: MILD/MODERATE	3
EDT 576	CURRICULUM: MILD/MODERATE	2
EDT 577	CAREER EDUCATION/SPECIAL EDUCATION	2
EDT 578	APPLICATION OF COMPUTERS/TECHNOLOGY IN SPECIAL EDUCATION	2
EDT 579	INSTRUCTIONAL STRATEGIES: MILD/MODERATE	3
EDT 587	STUDENT TEACHING: MILD/MODERATE	1
EDT 589	STUDENT TEACHING: MILD/MODERATE	1 - 7

Master of Science in Art Education (MSE.EAR) (EDT)

The concentration in art education is designed to help individuals gain perspective in the teaching of art in a larger community as well as teach candidates how to research issues in art education.

		Sem. Hrs.
Art Education		
Professional Education Requirements		
EDT 590	CURRICULUM THEORY IN ART EDUCATION	3
EDT 591	CURRENT ISSUES IN ART EDUCATION	3
EDT 629	COGNITION, LEARNING AND TECHNOLOGY	3
EDT 659	SPECIAL TOPICS IN TEACHING	1 - 3
VAE 583	TEACHING VISUAL ARTS	3
VAH 500	DIRECTED RESEARCH IN ART HISTORY	3

Master of Science in Interdisciplinary Educational Studies (MSE.EIP) (EDT)

A concentration in interdisciplinary studies offers the graduate candidate flexibility to design a program to meet diverse professional goals. Candidates must select coursework from both the School of Education and Allied Professions and from at least one department outside of the SOEAP.

	Sem. Hrs.
Interdisciplinary Educational Studies	
Approved Concentration Courses in Education	6-12
Approved Concentration Courses outside the SOEAP	6-12

Master of Science in Literacy (MSE.ERE) (EDT)

The master's degree concentration in literacy prepares a candidate to assume professional and leadership roles related to literacy in a school setting. The coursework in this concentration supports the performance outcomes as outlined by the Standards for Reading Professionals as adopted by the International Reading Association. Candidates must have already completed prerequisite reading requirements (EDT 600, EDT 600L, EDT 601, EDT 602, EDT 603, or equivalent).

		Sem. Hrs.
Literacy		
Concentration Requirements		
EDT 605 or 610	ADVANCED STUDY IN READING/LANGUAGE ARTS (EDT 605) ADVANCED STUDY IN READING/LANGUAGE ARTS (PK-PRIMARY) (EDT 610)	3
EDT 606	ASSESSMENT & EVALUATION OF READING DIFFICULTIES	3
EDT 607	PRACTICUM IN READING INTERVENTION TECHNIQUES	3
EDT 608	THE WRITING CLASSROOM	3
EDT 609	ISSUES, TRENDS, & RESEARCH IN READING	3
EDT 650[1]	PROFESSIONAL DEVELOPMENT OF TEACHER LEADERS	3

[1]EDT 650 or approved elective

Master of Science in Music Education (MSE.EUS) (EDT)

The concentration in music education is offered collaboratively through the School of Education and Allied Professions and the College of Arts & Sciences. This program is designed for music educators and focuses on practical applications to the music classroom and rehearsal room.

Prerequisite: Candidates must have a bachelor's degree or licensure in music education.

		Sem. Hrs.
Music Education		
Concentration Requirements		
MUS 501	GRADUATE SEMINAR IN MUSICOLOGY.	2
MUS 503	TEACHING WORLD MUSIC	2
MUS 511	MUSIC THEORY, ANALYSIS, AND TECHNOLOGY	2
MUS 531	FOUNDATIONS AND CURRENT ISSUES IN MUSIC EDUCATION	2
MUS 535 or 536 or 537	LITERATURE AND RESOURCES FOR CLASSROOM MUSIC (MUS 535) LITERATURE AND RESOURCES FOR THE CHORAL ENSEMBLE (MUS 536) LITERATURE AND RESOURCES FOR THE INSTRUMENTAL ENSEMBLE (MUS 537)	1
MUS 544 or 545 or 546	ADVANCED TECHNIQUES FOR CLASSROOM MUSIC (MUS 544) ADVANCED CHORAL CONDUCTING AND REHEARSAL TECHNIQUES (MUS 545) ADVANCED INSTRUMENTAL CONDUCTING AND REHEARSAL TECHNIQUES (MUS 546)	2
MUS 599	GRADUATE PERFORMANCE STUDIES	1
Electives (courses in MUS, EDT, EDW or EDA)		6

Master of Science in Teacher as Leader (MSE.ETL) (EDT)

The teacher as leader concentration offers teachers an opportunity to pursue professional development and leadership opportunities other than building and district administration. Teachers pursuing this degree would likely fulfill roles such as instructional leader, lead teacher, mentor teacher and curriculum committee member. All candidates in this concentration must complete the teacher leader core sequence; several options are available for specialty areas.

		Sem. Hrs.
Teacher as Leader		
Professional Education Requirements		
EDA 505	EDUCATIONAL LEADERSHIP	3

EDA 556	LEADERSHIP IN DIVERSE COMMUNITIES	3
EDT 650	PROFESSIONAL DEVELOPMENT OF TEACHER LEADERS	3

Choose from one of the following specialty areas:

Leadership

EDA 509	SUPERVISION & PROFESSIONAL DEVELOPMENT	3
EDA 511	CURRICULUM	3
EDA 515	SCHOOL LAW	3

Literacy

EDT 605 or 610	ADVANCED STUDY IN READING/LANGUAGE ARTS (EDT 605) ADVANCED STUDY IN READING/LANGUAGE ARTS (PK-PRIMARY) (EDT 610)	3
EDT 609	ISSUES, TRENDS, & RESEARCH IN READING	3
Elective		3

Special Education

EDT 572	INTRODUCTION TO EDUCATION OF LEARNERS WITH MILD/MODERATE NEEDS	3
EDT 573	COLLABORATING WITH FAMILIES, PROFESSIONALS, AND AGENCIES	3
EDT 574	BEHAVIOR MANAGEMENT	3

Technology

EDT 629	COGNITION, LEARNING AND TECHNOLOGY	3
EDT 631	PLANNING AND ASSESSING TECHNOLOGY ENHANCED LEARNING	3

Middle Childhood Education (LIC.EMS and MSE.EMS) (EDT)

Completion of the program requirements for middle childhood education leads to provisional licensure in the State of Ohio for grades 4-9. Candidates must complete approved licensure program coursework in two teaching concentration areas for initial licensure and one area for additional licensure. The teaching concentration areas include: mathematics, science, social studies, and reading/language arts. Concentration requirements also include professional education coursework. Candidates must pass the required PRAXIS II specialty area exam(s) prior to EDT 509 and the clinical experiences. Candidates must also pass the PRAXIS II Principles of Learning and Teaching prior to licensure.
Candidates may choose to complete the master's degree after completing the requirements for licensure by completing the core requirements for the master's degree. Student teaching hours will not count toward the 30 semester hour requirement for a master's degree.

		Sem. Hrs.
Middle Childhood Education		
Professional Education Requirements		
EDT 502 or 503	PHILOSOPHICAL STUDIES IN EDUCATION (EDT 502) HISTORY OF EDUCATION IN THE UNITED STATES (EDT 503)	3
EDT 507	THE PROFESSION OF TEACHING	2
EDT 507L	PROFESSION OF TEACHING LAB	1
EDT 508	THEORIES OF LEARNING AND HUMAN DEVELOPMENT	3
EDT 509	INSTRUCTION, MANAGEMENT, AND ASSESSMENT	3
EDT 530	THE MIDDLE SCHOOL PRINCIPLES AND PRACTICES	3
EDT 570	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
Reading Course Requirements		
EDT 600	READING METHODS	3
EDT 601	PHONICS, SPELLING, AND VOCABULARY	3
EDT 602	CRITICAL READING IN THE CONTENT AREAS	3
EDT 603	FOUNDATIONS OF LITERACY THROUGH LITERATURE	3
Methods courses (select two)		
EDT 532	READING/LANGUAGE ARTS FOR MIDDLE CHILDHOOD	3
EDT 533	MATH FOR MIDDLE CHILDHOOD	3
EDT 534	SCIENCE FOR MIDDLE CHILDHOOD	3
EDT 535	SOCIAL STUDIES FOR MIDDLE CHILDHOOD	3
EDT 549	STUDENT TEACHING MIDDLE CHILDHOOD	3 - 7

Middle Childhood Generalist Endorsement (END.EMS.GEN) (EDT)

The Department of Teacher Education offers the Middle Childhood Generalist Endorsement. This endorsement can be added to any existing Middle Childhood License for any combination of the four areas of concentration. The generalist endorsement will allow teachers to teach grades 4-6 only. Candidates must pass the required PRAXIS II exam(s) to receive the endorsement or pass the PRAXIS II Curriculum, Instruction, and Assessment prior to licensure.

		Sem. Hrs.
Middle Childhood Generalist Endorsement		
Language and Reading Requirements		
EDT 532[1]	READING/LANGUAGE ARTS FOR MIDDLE CHILDHOOD	3
EDT 608	THE WRITING CLASSROOM	3
Mathematics Requirements		
EDT 533[2]	MATH FOR MIDDLE CHILDHOOD	3
Science Requirements		
EDT 534[3]	SCIENCE FOR MIDDLE CHILDHOOD	3
Social Studies Requirements		
EDT 535[4]	SOCIAL STUDIES FOR MIDDLE CHILDHOOD	3
Undergraduate Course Requirements		
Math Requirements		
MTH 205 MATHEMATICAL CONCEPTS		3
Science Requirements (Any of:)		
SCI 190 THE PHYSICAL UNIVERSE		
and SCI 190L THE PHYSICAL UNIVERSE LABORATORY		
SCI 210 THE DYNAMIC EARTH		
and SCI 210L THE DYNAMIC EARTH LABORATORY		
SCI 230 ORGANISMS, EVOLUTION, AND ENVIRONMENT		
and SCI 230L ORGANISMS, EVOLUTION, AND ENVIRONMENT LABORATORY		
Social Studies Requirements		
HST 251 AMERICAN HISTORY TO 1865		3

[1] Can also be taken as EDT 426.
[2] Can also be taken as EDT 427.
[3] For more information about this course, please see the current issue of the Undergraduate Bulletin.
[4] Can also be taken as EDT 429.

Multi-age Education (LIC.EAG and MSE.EAG) (EDT)

Completion of the program requirements for multi-age education leads to provisional licensure in the State of Ohio for grades pre-kindergarten through twelve. Candidates must complete approved licensure program coursework in one of the following teaching concentration areas: foreign language, visual arts, and music. Concentration requirements also include professional education coursework. Candidate must pass required PRAXIS II specialty area exam(s) prior toEDT 509 and the clinical experiences. Candidates must also pass the PRAXIS II Principles of Learning and Teaching prior to licensure.

Candidates may choose to complete the master's degree after completing the requirements for licensure. Student teaching hours will not count toward the 30 semester hour requirement for a master's degree. See specific program requirements for details.

		Sem. Hrs.
Multi-age Education		
Professional Education Requirements		
EDT 502 or 503	PHILOSOPHICAL STUDIES IN EDUCATION (EDT 502) HISTORY OF EDUCATION IN THE UNITED STATES (EDT 503)	3
EDT 507	THE PROFESSION OF TEACHING	2
EDT 507L	PROFESSION OF TEACHING LAB	1
EDT 508	THEORIES OF LEARNING AND HUMAN DEVELOPMENT	3
EDT 509	INSTRUCTION, MANAGEMENT, AND ASSESSMENT	3
EDT 570	EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS	3
EDT 602	CRITICAL READING IN THE CONTENT AREAS	3
Methods courses specific to licensure: See advisor for specific courses.		3
Student teaching specific to licensure: See advisor for specific courses.		3-7

Reading Endorsement (END.ERE) (EDT)

The Reading Endorsement can be added only to an existing standard teaching certificate/license. The endorsement is for grades k - 12. To obtain the Reading Teacher Endorsement, candidates must have taken the required twelve hours in the teaching of reading as outlined by the State of Ohio Licensure Requirements. These may be taken at the graduate or undergraduate level. In addition to the required coursework, candidates must pass the PRAXIS II specialty area exam prior to receiving the endorsement.

		Sem. Hrs.
Reading Endorsement		
EDT 605 or 610	ADVANCED STUDY IN READING/LANGUAGE ARTS (EDT 605) ADVANCED STUDY IN READING/LANGUAGE ARTS (PK-PRIMARY) (EDT 610)	3
EDT 606	ASSESSMENT & EVALUATION OF READING DIFFICULTIES	3
EDT 607[1]	PRACTICUM IN READING INTERVENTION TECHNIQUES	3

[1]EDT 607 or approved elective

Technology-Enhanced Learning (END.TEC and MSE.TEC) (EDT)

This graduate program prepares in-service teachers to integrate technology-enhanced learning into their own teaching and to assist other professionals in their buildings in accomplishing the same. The courses focus on helping master's candidates increase teacher and student learning in the context of a technology-enhanced, problem-based learning environment. Some courses for this degree apply to the Computer Technology Endorsement from the State of Ohio.

		Sem. Hrs.
Technology-Enhanced Learning		
Concentration Requirements		
EDT 629	COGNITION, LEARNING AND TECHNOLOGY	3
EDT 630	MULTIMEDIA PRODUCTION	3
EDT 631	PLANNING AND ASSESSING TECHNOLOGY ENHANCED LEARNING	3
EDT 632	DISTANCE EDUCATION IN A DIGITAL AGE	3
EDT 633	WEB DESIGN AND DEVELOPMENT	3
EDT 634	BECOMING AN EFFECTIVE BUILDING TECHNOLOGY LEADER	3

Courses (Collapse All Courses)

Code Title Sem. Hrs.

EDT 500 MODELS OF TEACHING 3

This course is a study of eight instructional models specifically designed to meet the needs of diverse learners. Candidates will be expected to design instructional units that integrate the models.

EDT 502 PHILOSOPHICAL STUDIES IN EDUCATION 3

Study of the writings of major philosophers as they relate to education (including those in the Marianist tradition). Interpretations are made for the development of a critical, personal theory of teaching, counseling, educational administration, and psychological services.

EDT 503 HISTORY OF EDUCATION IN THE UNITED STATES 3

This course is a study of the relationship of schools and social change in the United States from Colonial times to the present. Interpretations of changes in educational policies for the development of a critical theory of education are discussed.

EDT 507 THE PROFESSION OF TEACHING 2

This course is designed to study the principal components of effective teaching that facilitate the learning of all students. Current educational issues, the PRAXIS III/Pathwise framework, INTASC standards, other professional standards, developing a community of learners, service learning and teaching incorporating the Marianist traditions are other topics of the course.
Prerequisite(s): Acceptance to School of Education and Allied Professions.
Corequisite(s): EDT 507L.

EDT 507L PROFESSION OF TEACHING LAB 1

This course accompanies 507, and is designed to study the principal components of effective teaching and will serve primarily, initical licensure candidates.
Corequisite(s): EDT 507.

EDT 508 THEORIES OF LEARNING AND HUMAN DEVELOPMENT 3

This course is a study of theories of learning and human development (physical, social, emotional, intellectual, and moral) as they relate to PK - 12 practices, including early, middle, and adolescent/young adult licensure areas.

EDT 509 INSTRUCTION, MANAGEMENT, AND ASSESSMENT 3

This course is a study of curriculum, instruction, management styles, and assessment techniques that promote student learning and achievement. Emphasis is on classroom-based theory-to-practice connections. This course is primarily intended for initial licensure candidates. Field experience required.
Prerequisite(s): EDT 508; a passing score on the PRAXIS II specialty area exam(s).

EDT 510 INTRODUCTION TO TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION 2

This course is an introduction to the early childhood cohort group and to transdisciplinary methods of teaming and collaboration. Candidates will work in teams to explore educational models and current issues associated with the field of early childhood education. This course is technology enhanced. Early childhood cohort application must have been submitted and approved before registering for this course.
Prerequisite(s): (EDT 504 or 508); EDT 570.

EDT 511 INTEGRATED CURRICULUM FOR YOUNG CHILDREN 2

This course introduces and develops the theoretical and practical bases for the creation of integrated curriculum for infants, toddlers, and preschoolers using a play-based approach. The content areas of mathematics and science provide opportunities for Reggio style documentation, and the Ohio Early Learning Academic Content Standards are emphasized.

EDT 512 SUMMER PLAY INSTITUTE 2

The Summer Play Institute is a field-based forum in which candidates implement the integrated curriculum activities developed in EDT 511. Candidates will engage in child-initiated play sessions that will be videotaped and reviewed by members of the cohort and the instructor. Supported play which facilitates development will be emphasized.
Prerequisite(s): EDT 510 (may be taken as a corequisite).

EDT 513 DEVELOPMENTALLY AND INDIVIDUALLY APPROPRIATE PRACTICE 3

The course shifts focus from the age-appropriate practice to the needs of the individual child and family. Candidates will learn to develop practice that supports and facilitates the development of young children ages birth to 8 - specifically those with disabilities. Significant review of related research drives this course. Field Experience required.
Prerequisite(s): EDT 510.

EDT 514 CURRICULUM AND INSTRUCTION FOR INFANTS AND TODDLERS WITH SPECIAL NEEDS 3

This course focuses on the planning and instructional methods, materials and evaluation techniques for working with young children who are at risk for or who have been identified with developmental delays (birth-age 3) and their families. Field Experience Required.
Prerequisite(s): EDT 510.

EDT 516 COLLABORATIVE ASSESSMENT BIRTH TO AGE 8 3

This course is the study of the transdisciplinary and collaborative nature of assessment in diagnosis, screening, and instruction of young children (birth to age 8) who are typically developing as well as those with disabilities. The course will focus on the role of the family in the assessment process. Systemic observation using a play-based approach will be emphasized.
Prerequisite(s): EDT 510.

EDT 517 EARLY CHILDHOOD SEMINAR ON MEDICAL AND HEALTH ISSUES 2

This course is the study of the health care and medical needs associated with young children with disabilities.
Prerequisite(s): EDT 513.

EDT 518 INTEGRATED CURRICULUM AND INSTRUCTION FOR KINDERGARTEN-PRIMARY GRADES 4

This course will focus on integrating curriculum and instruction for kindergarten and the primary grades. Special attention will be paid to the Ohio academic content standards with an emphasis on science, social studies, and math instruction. Planning, instructional methods, materials, and evaluation techniques for teaching children on the kindergarten-primary levels will be covered. Field experience required.
Prerequisite(s): EDT 509.

EDT 527 STUDENT TEACHING K-PRIMARY 3 - 7

Supervised and evaluated teaching in a preschool special needs setting. The candidate will demonstrate the knowledge, skills, attitudes and dispositions needed to comply with the National Association for the Education of Young Children (NAEYC) and the Division for Early Childhood of the Council of Exceptional Children (DEC) guidelines for appropriate practice.
Prerequisite(s): Registration for the course and approved student teaching/internship application packet submitted to the Department of Teacher Education at the beginning of the term prior to the student teaching experience.

EDT 528 INTERNSHIP IN TRANSDISCIPLINARY EARLY CHILDHOOD EDUCATION (Ages 3-5) 3

Supervised and evaluated teaching in a preschool special needs setting. The candidate will demonstrate the knowledge, skills, attitudes and dispositions needed to comply with the National Association for the Education of Young Children (NAEYC) and the Division for Early Childhood of the Council of Exceptional Children (DEC) guidelines for appropriate practice. Field experience required.
Prerequisite(s): Registration for the course and approved student teaching/internship application packet submitted to the Department of Teacher Education at the beginning of the term prior to the student teaching experience.

EDT 529 INTERNSHIP IN EARLY INTERVENTION (Birth to Age 3) 3

Supervised and evaluated teaching in an infant/toddler educational setting. Candidates are to demonstrate the knowledge, skills, attitudes and dispositions needed to comply with the National Association for the Education of Young Children (NAEYC) and the Division for Early Childhood and the Council of Exceptional Children (DEC) guidelines for appropriate practice. Field Experience Required.
Prerequisite(s): Registration for the course and approved student teaching/internship application packet submitted to the Department of Teacher Education at the beginning of the term prior to the student teaching experience.

EDT 530 THE MIDDLE SCHOOL PRINCIPLES AND PRACTICES 3

This course is primarily a study of organization (school structure), philosophy, and curriculum of middle-level education (9-14 year olds), grades 4-9. It is designed to present the theoretical knowledge base about middle-level (school) education. Issues and concerns, current trends and the essential elements relating to middle level education will be discussed throughout the semester of study. A variety of inquiry methods will be modeled that encourage critical thinking skills.

EDT 531 CLASSROOM ENVIRONMENT FOR MIDDLE CHILDHOOD 3

This course is the study of the middle childhood student within the classroom environment. Theories of learning and practical applications, motivation, classroom management and discipline, lesson and unit planning, teaching methodologies and assessment are examined and practiced. Field Experience Required.

EDT 532 READING/LANGUAGE ARTS FOR MIDDLE CHILDHOOD 3

This course focuses on the planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching reading/language arts to students in the middle schools with varied needs and abilities. The topics emphasized in this course include: an understanding of Ohio's academic content standards for grades 4-9, applications and instructional techniques that address the Ohio achievement tests, various resources, technologies, interdisciplinary connections, various grouping techniques, and current research.
Prerequisite(s): EDT 530; (EDT 531 or EDT 509); EDT 603; passing score on PRAXIS II specialty area exam.
Corequisite(s): A second content methods course.

EDT 533 MATH FOR MIDDLE CHILDHOOD 3

This course focuses on the planning, diagnosis, instructional methods, materials, assessment and evaluation techniques for teaching mathematics to students in the middle schools with varied needs and abilities. The topics emphasized in this course include: an understanding of Ohio's academic content standards for grades 4-9, applications and instructional techniques that address the Ohio proficiency tests, various resources, technologies, manipulatives, and other visuals, interdisciplinary connections, various grouping techniques, and current research.
Prerequisite(s): EDT 530; (EDT 531 or EDT 509); EDT 603; passing score on PRAXIS II specialty area exam.
Corequisite(s): A second content methods course.

EDT 534 SCIENCE FOR MIDDLE CHILDHOOD 3

This course focuses on the planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching science to students in the middle schools with varied needs and abilities. The topics emphasized in this course include: an understanding of Ohio's academic content standards for grades 4-9, applications and instructional techniques that address the Ohio achievement tests, various resources, technologies, experiments, and other hands-on experiences, interdisciplinary connections, various grouping techniques, and current research.
Prerequisite(s): EDT 530; (EDT 531 or EDT 509); EDT 603; passing score on PRAXIS II specialty area exam.
Corequisite(s): A second content methods course.

EDT 535 SOCIAL STUDIES FOR MIDDLE CHILDHOOD 3

This course focuses on the planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching social studies to students in the middle schools with varied needs and abilities. The topics emphasized in this course include: an understanding of Ohio's academic content standards for grades 4-9, applications and instructional techniques that address the Ohio achievement tests, various resources, technologies and active hands-on experiences, other visuals, interdisciplinary connections, various grouping techniques, and current research.
Prerequisite(s): EDT 530; (EDT 531 or EDT 509); EDT 603; passing score on PRAXIS II specialty area exam.
Corequisite(s): A second content methods course.

EDT 549 STUDENT TEACHING MIDDLE CHILDHOOD 3 - 7

Full-time supervised and evaluated teaching in grades 4-9 in at least one of the two candidate's concentration subjects. The candidate will demonstrate the knowledge, skills and dispositions required of a beginning middle-level teacher. Attendance at weekly seminars is required.
Prerequisite(s): (Two of the following: EDT 532, 533, 534, 535); formal admission to student teaching a full term in advance.

EDT 550 INTEGRATED LANGUAGE ARTS METHODS FOR ADOLESCENT TO YOUNG ADULT 3

This course focuses on planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching all levels of integrated language arts to students in grades 7-12 with varied needs and abilities. Topics include: understanding Ohio's academic content standards for grades 7-12, applications and instructional techniques that address the Ohio achievement and competency tests, various resources, technologies, interdisciplinary connections, various grouping techniques, best practices, and current research. This course is for initial licensure candidates. Field experience required.
Prerequisite(s): EDT 508, 509; passing score on PRAXIS II specialty area exam.

EDT 551 INTEGRATED SOCIAL STUDIES METHODS FOR ADOLESCENT TO YOUNG ADULT 3

This course focuses on planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching all levels of integrated social studies to students in grades 7-12 with varied needs and abilities. Topics include: understanding Ohio's academic content standards for grades 7-12, applications and instructional techniques that address the Ohio achievement and competency tests, various resources, technologies, hands-on activities, interdisciplinary connections, various grouping techniques, best practices, and current research. This course is for initial licensure candidates. Field experience required.

Prerequisite(s): EDT 508, 509; passing score on PRAXIS II specialty area exam .

EDT 552 FOREIGN LANGUAGE METHODS FOR ADOLESCENT TO YOUNG ADULT 3

This course focuses on planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching all levels of foreign language to students in grades 7-12 with varied needs and abilities. Topics include: understanding Ohio's academic content standards for grades 7-12, applications and instructional techniques that address the Ohio achievement and competency tests, various resources, technologies, hands-on activities and other visuals, interdisciplinary connections, various grouping techniques, best practices, and current research. This course is for initial licensure candidates. Field experience required.
Prerequisite(s): EDT 508, 509; passing score on PRAXIS II specialty area exam .

EDT 553 MATH METHODS FOR ADOLESCENT TO YOUNG ADULT 3

This course focuses on planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching all levels of mathematics to students in grades 7-12 with varied needs and abilities. Topics include: understanding Ohio's academic content standards for grades 7-12, applications and instructional techniques that address the Ohio achievement and competency tests, various resources, technologies, manipulatives, hands-on activities, and other visuals, interdisciplinary connections, various grouping techniques, best practices, and current research. This course is for initial licensure candidates. Field experience required.
Prerequisite(s): EDT 508, 509; passing score on PRAXIS II specialty area exam.

EDT 554 SCIENCE METHODS FOR ADOLESCENT TO YOUNG ADULT 3

This course focuses on planning, diagnosis, instructional methods, materials, assessment, and evaluation techniques for teaching all levels of science to students in grades 7-12 with varied needs and abilities. Topics include: understanding Ohio's academic content standards for grades 7-12, applications and instructional techniques that address the Ohio achievement and competency tests, various resources, technologies, hands-on activities, and interdisciplinary connections, various grouping techniques, safety issues, best practices, and current research. This course is for initial licensure candidates. Field experience required.
Prerequisite(s): EDT 508, 509; passing score on PRAXIS II specialty area exam .

EDT 555 RELIGION METHODS 3

This course examines the planning, diagnosis, instructional methods, material, and assessment techniques utilized in teaching religion to students with varied needs and abilities. Field Experience Required.

EDT 562 TOPICS IN SCIENCE INSTRUCTION 1 - 3

This course is a study of research in contemporary science instruction, materials, and curriculum.

EDT 563 TOPICS IN MATHEMATICS INSTRUCTION 1 - 3

This course is a study of research in contemporary mathematics instruction. Emphases include effective curriculum and curricular materials.

EDT 569 STUDENT TEACHING - ADOLESCENT TO YOUNG ADULT 3 - 7

Full-time supervised and evaluated teaching in the content area in a junior or senior high school classroom. The candidate will demonstrate the knowledge, skills, and dispositions required of a beginning secondary teacher. Attendance at weekly seminars is required.
Prerequisite(s): Passing score on PRAXIS II specialty area exam; completion of 80% of content area courses; formal admission to student teaching a semester in advance.

EDT 570 EDUCATING DIVERSE STUDENT POPULATIONS IN INCLUSIVE SETTINGS 3

This course is the study of the characteristics, legal aspects, and educational needs of students with challenges in learning. The role of the general educator in making curricular modifications and accommodations, adapting instruction and collaborating with other educators to facilitate learning in the general classroom for these students is examined. Field experience required.

EDT 571 LANGUAGE DEVELOPMENT AND EMERGENT LITERACY 3

This course is the study of oral language and literacy development in children, with implications for all learners, including children with special needs.
Prerequisite(s): EDT 570.

EDT 572 INTRODUCTION TO EDUCATION OF LEARNERS WITH MILD/MODERATE NEEDS 3

This course is the study of the role and function of the intervention specialist. This course presents issues of definition, identification, and placement procedures. The candidate will acquire knowledge of major researchers and history, variations in belief, traditions and values across cultures, and current practices in the field. Field experience required.
Prerequisite(s): EDT 570.

EDT 573 COLLABORATING WITH FAMILIES, PROFESSIONALS, AND AGENCIES 3

This course examines theories and techniques to assist teachers in working with professionals, families and agency personnel to provide an appropriate educational program, improve home-school relationships and develop family-professional partnerships. Historical and legal perspectives of parental influence on special education services are examined.
Prerequisite(s): EDT 570.

EDT 574 BEHAVIOR MANAGEMENT 3

This course examines the principles and methods of observing, recording, assessing, and managing human behavior with emphasis on students with disabilities.
Prerequisite(s): EDT 570.

EDT 575 ASSESSMENT: MILD/MODERATE 3

This course is the study of the multidisciplinary use of assessment instruments and techniques in the diagnosis, planning and evaluation of the special needs learner and the development of individual education programs. Field experience required.
Prerequisite(s): EDT 570, 572, 573, 574.

EDT 576 CURRICULUM: MILD/MODERATE 2

This course is the study of curriculum development considering the motor, cognitive, academic, social, language, affective, functional, life skills, and individual programming of students with mild/moderate disabilities. Field experience required.
Prerequisite(s): EDT 570, 572, 573, 574, 575.
Corequisite(s): EDT 579.

EDT 577 CAREER EDUCATION/SPECIAL EDUCATION 2

This course examines the theories and techniques of job classification, assessment, selection, placement, and activities related to work experience. Career development and transition needs are examined for teachers working with preschoolers to adults.
Prerequisite(s): EDT 570.

EDT 578 APPLICATION OF COMPUTERS/TECHNOLOGY IN SPECIAL EDUCATION 2

This course is the study of basic computer applications in special education, including instructional programs, software evaluation, telecommunications, multimedia and hypermedia, assistive technology, augmentative devices, resources, and legal/ethical issues.
Prerequisite(s): EDT 570; basic computing/technology skills.

EDT 579 INSTRUCTIONAL STRATEGIES: MILD/MODERATE 3

This course examines the strategies, materials, and evaluation techniques for teaching students with mild/moderate learning needs. Field experience required.
Prerequisite(s): EDT 570, 572, 573, 574, 575.
Corequisite(s): EDT 576, 589.

EDT 587 STUDENT TEACHING: MILD/MODERATE 1

Supervised and evaluated teaching with students demonstrating mild/moderate learning needs. The candidate will demonstrate the knowledge, skills, and dispositions of an intervention specialist. Attendance at seminars may be required.
Prerequisite(s): EDT 575,575L,576,576L,579,579L, and approval of faculty.

EDT 589 STUDENT TEACHING: MILD/MODERATE 1 - 7

Supervised and evaluated teaching with students demonstrating mild/moderate learning needs. The candidate will demonstrate the knowledge, skills and dispositions of an intervention specialist. Attendance at seminars may be required.
Prerequisite(s): EDT 575, 576, 579.

EDT 590 CURRICULUM THEORY IN ART EDUCATION 3

This course is an analysis of critical, aesthetic, artistic, and historical theories in the education curriculum, with emphases on planning, diagnosis, instructional methods, evaluation techniques and the interdependence of the community, school, art educator and students in diverse settings.

EDT 591 CURRENT ISSUES IN ART EDUCATION 3

This course is a study and analysis of literature on teaching approaches to art education. The role of the art teacher is examined with an emphasis on developing an awareness of various philosophical positions on current issues in art education.

EDT 599 STUDENT TEACHING-ART (P-12) 3 - 7

Full-time supervised and evaluated teaching in art classes in school (P-12). The candidate will demonstrate the knowledge, skills, and dispositions required of a beginning art teacher. Attendance at weekly seminars is required.
Prerequisite(s): Passing score on PRAXIS II specialty area exam; completion of 80% of content area courses; formal admission to student teaching a semester in advance.

EDT 600 READING METHODS 3

An integrated language arts course focusing on the knowledge base underpinning the teaching of reading and related language arts processes within the language arts and across curriculum to students of various ages, needs, and abilities. Topic include: planning, instructional methods, materials, assessment, and evaluation techniques. Field experience: 24 hours. This course is part of Ohio's 12 Hour State Mandated Reading Core. Early childhood, middle childhood, and intervention specialist licensure candidates must meet this requirement. Adolescence/young adult candidates are also required to meet this requirement if working toward Ohio's Reading Teacher Endorsement.

EDT 601 PHONICS, SPELLING, AND VOCABULARY 3

This course provides the background knowledge necessary for effectively teaching and assessing the role of phonics in the reading process. Emphasis is on developing phonemic awareness, phonics, spelling, and word recognition/word meaning embedded in the context of a total reading/language arts program focused on meaning construction. This course is part of Ohio's 12 Hour State Mandated Reading Core. Early childhood, middle childhood and intervention specialist licensure students must meet this requirement. Adolescent/young adult candidates are also required to meet this requirement if working toward Ohio's Reading Teacher Endorsement.

EDT 602 CRITICAL READING IN THE CONTENT AREAS 3

In this course, middle childhood and intervention specialist candidates examine the strategies and techniques in the development of prior knowledge skills, study skills, vocabulary, technology, and assessment as they relate to critical reading abilities in a variety of curriculum areas. This course is part of Ohio's 12 Hour State Mandated Reading Core. Early childhood, middle childhood, intervention specialist, and multi-age licensure students must meet this requirement.

EDT 603 FOUNDATIONS OF LITERACY THROUGH LITERATURE 3

This course serves as an introductory course to the reading/language arts (listening, speaking, reading, writing, viewing, visual representation) and the role literature plays in these processes. It is a foundation course in reading and is intended to align with the requirements of Ohio Reading Core licensure standards for the early childhood, middle childhood, and intervention specialist programs. Topics examined include the foundations of literacy, research theories and related models of reading, aspects and structures of text, various children's and young adult literature, the integration of technology in literacy, an overview of the importance of on-going assessment in teaching reading/language arts, and an awareness of cultural, linguistic, and ethnic diversity in individual learners. This course is part of Ohio's 12 Hour State Mandated Reading Core. Early childhood, middle childhood and intervention specialist licensure students must meet this requirement. Adolescence/young adult candidates are also required to meet this requirement if working toward Ohio's Reading Teacher Endorsement.

EDT 605 ADVANCED STUDY IN READING/LANGUAGE ARTS 3

This course is designed to provide teachers the opportunity to extend their knowledge of the reading/language arts processes and the principles underlying effective instruction. Key concepts are drawn from recent research and theory in language learning, developmental reading research, and research describing the literacy processes of children.

EDT 606 ASSESSMENT & EVALUATION OF READING DIFFICULTIES 3

This course is the study of formal and informal diagnostic tests and procedures for identifying reading strengths and weaknesses with applications for reading programs. Candidates must register for EDT 607 the next semester.
Prerequisite(s): EDT 605 or 610.

EDT 607 PRACTICUM IN READING INTERVENTION TECHNIQUES 3

In this course the candidate will apply knowledge of informal and formal evaluation instruments for diagnosing reading ability and disability and their causes with students and to plan appropriate intervention experiences for those students. Laboratory portion of EDT 606. This course must be taken the semester immediately following EDT 606.
Prerequisite(s): EDT 606.

EDT 608 THE WRITING CLASSROOM 3

This course will focus on the teacher as a writer. Elements of the writing process will be discussed and implemented. Candidate will develop a classroom writing program.

EDT 609 ISSUES, TRENDS, & RESEARCH IN READING 3

A basic course for teachers concerned with the psychology of learning to read and current issues, trends and research in teaching reading/language arts.

EDT 610 ADVANCED STUDY IN READING/LANGUAGE ARTS (PK-PRIMARY) 3

This course will focus on early literacy acquisition and development. Principles underlying effective instruction in early childhood settings will be explored.

EDT 629 COGNITION, LEARNING AND TECHNOLOGY 3

This course focuses on the connections between cognitive psychology and technology-enhanced teaching and learning. New insights emerging from the latest research on human cognition have important implications for instructional design. Such insights suggest ways of teaching and learning that foster deep understanding, better thinking, and the use of knowledge to solve complex problems. Students will learn how to build technology-enhanced, problem-based learning environments grounded in the latest research on human cognition and constructivist learning theory. This course is the gateway course leading to the Master of Science in Education with a concentration in technology-enhanced learning. It is the prerequisite for all other courses in the program.

EDT 630 MULTIMEDIA PRODUCTION 3

This course will allow students to manipulate and manage multimedia resources, including presentation software, graphics, and audio and video clips to create engaging learning experiences. Students will engage in multimedia activities that focus on classroom technology integration.
Prerequisite(s): EDT 629.

EDT 631 PLANNING AND ASSESSING TECHNOLOGY ENHANCED LEARNING 3

In this course, candidates will learn how to systematically plan and assess growth in the use of technology by K-12 teachers, students, and administrators.
Prerequisite(s): EDT 629.

EDT 632 DISTANCE EDUCATION IN A DIGITAL AGE 3

This course prepares the candidate to design powerful learning experiences that connect students to the real world by using a variety of distance education tools, including Web-based and teleconferencing technologies.
Prerequisite(s): EDT 629.

EDT 633 WEB DESIGN AND DEVELOPMENT 3

This course is designed to be an introductory level course for educators with no previous web design experience. The course focuses on using HTML authoring software on building a working website that can be implemented for a typical classroom setting. Upon completion of this course, students will have developed a class web site and demonstrate the technical proficiency to update their web site as needed.
Prerequisite(s): EDT 630.

EDT 634 BECOMING AN EFFECTIVE BUILDING TECHNOLOGY LEADER 3

This capstone course examines the practical concerns of becoming a building leader and resource in the integration of technology-enhanced learning. Study of research on leadership and innovation undergirds the candidate's understanding of the issues of building level mangement. Field experience required.
Prerequisite(s): EDT 631, 632, 633.

EDT 650 PROFESSIONAL DEVELOPMENT OF TEACHER LEADERS 3

This course is a study of existing and emerging models of professional development designed to provide classroom teachers with opportunities to assume new leadership roles and responsibilities in the school community.

EDT 658 INDEPENDENT STUDY 1 - 3

This course is an in-depth study of a selected educational topic. The candidate develops an individual learning plan that includes objectives, schedule of readings, and assignments, products and methods of evaluation.
Prerequisite(s): Permission of department chairperson.

EDT 659 SPECIAL TOPICS IN TEACHING 1 - 3

This course is the study of specialized areas of education not typically included in the professional education sequence. Topics are announced.

EDT 660 INTRODUCTION TO EDUCATIONAL RESEARCH 3

This course is a study of key components necessary to understand, analyze, and evaluate research. Emphasis is on understanding the foundational principles of inquiry and related issues. EDT 660 is taken early in the master's program

EDT 662 THESIS 2

The thesis serves as the culmination of courses in a candidate's graduate program where thesis was chosen as a research option. There is a mandatory two-term requirement for thesis.

EDT 663 THESIS 2

The thesis serves as the culmination of courses in a candidate's graduate program where thesis was chosen as a research option. There is a mandatory two-term requirement for thesis.

EDT 667 EDUCATIONAL RESEARCH SEMINAR 3

In this course students apply the principles of design by implementing a research study in an educational setting. The findings are presented in a public forum. This course is the capstone learing activity of the Master's Degree.
Prerequisite(s): EDT 660

EDT 671 CURRENT ISSUES IN EDUCATION 3

This course is a study of selected educational initiatives as related to policy and practice.

EDT 672 HISTORY OF HIGHER EDUCATION IN THE UNITED STATES 3

This course is a study of the development of post-secondary American education from Colonial times to the present with special emphasis on mission, purposes, governance and curriculum as they change over time and differ by institutional type.

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the Bulletin
AUGUST 2006 - GRADUATE ISSUE
→ Explore a Different Issue

College of Arts and Sciences

(VAR) Visual Arts (Collapse Description)

Professor Fred Niles, Chairperson

* There is no graduate program in visual arts at this time. The courses listed below support other graduate programs.

Courses (Collapse All Courses)

Code	Title	Sem. Hrs.
VAE 583	TEACHING VISUAL ARTS	3

Study of curriculum, planning, theory, and practice for teaching visual arts to students pre-kindergarten through grade 12. Studio fee.
Prerequisite(s): Permission; pass Praxis II.
Corequisite(s): Field experience.

Code	Title	Sem. Hrs.
VAH 500	DIRECTED RESEARCH IN ART HISTORY	3

Advanced study with faculty direction in Art History. Topics may vary.
Prerequisite(s): Undergraduate degree: Bachelor of Fine Arts or Bachelor of Arts or Bachelor of Science in Education with a concentration in art education.
Corequisite(s): Graduate level status; candidate for a Master of Science in Education with a concentration in art education.

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Religious Studies
Teacher Education
Visual Arts

Explore

Explore by Program:

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Aerospace Engineering (AEE)
Applied Mathematics (MAS)
Art Education (MSE.EAR) (EDT)

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Explore by Courses:

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Teacher Education (EDT)
Visual Arts (VAE)
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