VISIT THE CAMPUS

Lawrence Technological University welcomes prospective students, family members, employers, and others to visit. While on campus, prospective students are encouraged to discuss their educational plans with admissions staff and to meet current Lawrence Tech students, professors, or deans. Call the Admissions Office toll free at 1.800.CALL.LTU (225.5588) to arrange an appointment or to request additional information. The Admissions Office is open (except holidays) Monday-Thursday 8 a.m.-8 p.m., and Friday 8 a.m.-4:30 p.m. If you plan to visit during the summer, please contact the Admissions Office for summer hours.

ON THE COVER

Lawrence Tech’s 120-acre full-service campus provides a full range of academic, recreational, and residential facilities, along with convenient access to major freeways. Southeastern Michigan is one of America’s hubs of business and commerce, the site of some of the world’s outstanding accomplishments. Large photo is the entrance to the University Technology and Learning Center.

ABOUT THIS GRADUATE CATALOG

This Graduate Catalog is a compendium of opportunities available at Lawrence Technological University. It includes information on academic programs, requirements for admission and graduation, rules, regulations, and expectations. Failure to read this Graduate Catalog does not excuse students from the requirements and regulations described herein. While every effort is made to provide accurate and current information, the University reserves the right to change rules, policies, fees, curricula, courses, and other programs described to reflect faculty or administrative action. This Graduate Catalog is accurate as of the publication date. For information about undergraduate programs, refer to Lawrence Tech’s Undergraduate Catalog.

CONTACTING LAWRENCE TECH

The University’s address is: 21000 West Ten Mile Road, Southfield, MI 48075-1058. The main phone number is 248.204.4000. Visit Lawrence Tech on the web at www.ltu.edu.

NOTICE OF NON-DISCRIMINATORY POLICY

Lawrence Technological University adheres and conforms to all federal, state, and local civil rights regulations, statutes and ordinances. No person, student, faculty or staff member will knowingly be discriminated against relative to the above statutes. LAWRENCE TECHNOLOGICAL UNIVERSITY IS AN EQUAL OPPORTUNITY EMPLOYER.

STUDENT IMAGES

Lawrence Technological University reserves the right to use images of student work and of students on campus, or at any of its offsite locations, for the purpose of promoting the University. Students not wishing to be photographed should notify the Registrar in writing when they register each semester.
Announcement of General Information and Courses in the Colleges of

- Architecture and Design
- Arts and Sciences
- Engineering
- Management

For the Academic Years 2003-2005
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Lawrence Tech in brief Back Cover
2003-2005 Semester initial class dates indicated in bold.
FALL 2003 SEMESTER

April 7-11 Advance Registration
April 14-August 27 Registration
August 26 Last day to register without a late fee
August 27 Classes begin; Late registration fee applies
August 28 Add/Drop period begins
August 30 Last day of classes before Labor Day recess
September 2 Classes resume
September 10 Last day to drop classes with 100% tuition credit
September 11 Withdrawal period begins for dropped classes; late transaction fee applies for courses added
November 19 Last day to withdraw
November 26 Last day of classes before Thanksgiving recess
December 1 Classes resume
December 13 Last day of classes before final exams
December 15-18 Final exam week
December 19 Fall 2003 semester ends

SPRING 2004 SEMESTER

November 3-7 Advance Registration
November 7-January 12 Registration
January 9 Last day to register without a late fee
January 12 Classes begin; Late registration fee applies
January 13 Add/Drop period begins
January 19* Martin Luther King Day Celebration (see below)
January 23 Last day to drop classes with 100% tuition credit
January 24 Withdrawal period begins for dropped classes; late transaction fee applies for courses added
March 6 Last day of classes before mid-semester break
March 8-13 Mid-semester break
March 15 Classes resume
April 9 Last day to withdraw
May 1 Last day of classes before final exams
May 3-7 Final exam week
May 16 Commencement
May 17 Spring 2004 semester ends

SUMMER 2004 SEMESTER

Summer Session A:
April 5-9 Advance Registration
April 10-May 12 Registration
May 11 Last day to register without a late fee
May 12 Classes begin; Late registration fee applies
May 13 Add/Drop period begins
May 18 Last day to drop classes with 100% tuition credit
May 19 Withdrawal period begins for dropped classes; late transaction fee applies for courses added
May 29 Last day of classes before Memorial Day
June 1 Classes resume
June 9 Last day to withdraw
June 23 Summer 2004 Session A ends

Summer Session B:
April 5-9 Advance registration
April 10-July 6 Registration
July 3 Last day to register without a late fee
July 6 Classes begin; late registration fee applies
July 7 Add/Drop period begins
July 12 Last day to drop classes with 100% tuition credit
July 13 Withdrawal period begins for dropped classes; late transaction fee applies for courses added
August 7 Last day to withdraw
August 14 Summer 2004 Session B ends

Summer Session E:
April 5-9 Advance registration
April 10-May 12 Registration continues
May 11 Last day to register without a late fee
May 12 Classes begin; Late registration fee applies
May 13 Add/Drop period begins
May 29 Last day of classes before Memorial Day
June 1 Classes resume
May 25 Last day to drop classes with 100% tuition credit
May 26 Withdrawal period begins for dropped classes; late transaction fee applies for courses added
July 3 Last day of classes before Independence Day
July 6 Classes resume
July 7 Last day to withdraw
July 22 Summer 2004 Session E ends

*The University is open and classes are held on Martin Luther King Day.

To afford an opportunity to all members of the University community, students, faculty, and staff who may desire to participate in the Freedom Walk celebrating Dr. Martin Luther King’s life and legacy, upon request, may be excused from any scheduled classes, office hours, meetings, etc. from 11:00 a.m. – 1:00 p.m. Temporary help, substitute instruction, rescheduling, etc. will be provided as needed. During this period, all mandatory activities such as exams, presentations or other graded activities will be deferred, although assignments may be made by e-mail for subsequent sessions.
# Academic Schedule 2003–2006

## Fall 2004 Semester
- **April 5-9**: Advance Registration
- **April 10-August 25**: Registration
- **August 24**: Last day to register without late fee
- **August 25**: Classes begin; late registration fee applies
- **August 26**: Add/Drop period begins
- **September 4**: Last day of classes before Labor Day recess
- **September 7**: Classes resume
- **September 8**: Last day to drop with 100% tuition credit
- **September 9**: Withdrawal period begins for dropped classes; late transaction fee applies for courses added
- **November 17**: Last day to withdraw
- **November 24**: Last day of classes before Thanksgiving recess
- **November 29**: Classes resume
- **December 10**: Last day of classes before final exams
- **December 13-16**: Final exam week
- **December 17**: Fall 2004 semester ends

## Spring 2005 Semester
- **November 1-5**: Advance registration
- **November 6-January 10**: Registration
- **January 7**: Last day to register without late registration fee
- **January 10**: Classes begin; late registration fee applies
- **January 11**: Add/Drop period begins
- **January 21**: Last day to drop classes with 100% tuition credit
- **January 22**: Withdrawal period begins; late transaction fee applies for courses added
- **January 17**: Martin Luther King Day Celebration
- **March 5**: Last day of classes before mid-semester break
- **March 7-11**: Mid-semester break
- **March 14**: Classes resume
- **April 8**: Last day to withdraw
- **April 29**: Last day of classes before final exams
- **May 2-6**: Final exam week
- **May 15**: Commencement
- **May 16**: Spring 2005 semester ends

## Summer 2005 Semester
- **Summer Session A**:
  - **April 4-8**: Advance Registration
  - **April 9-May 17**: Registration
  - **May 17**: Last day to register without a late fee
  - **May 18**: Classes begin; Late registration fee applies
  - **May 19**: Add/Drop period begins
  - **May 24**: Last day to drop classes with 100% tuition credit
  - **May 25**: Withdrawal period begins for dropped classes; late transaction fee applies for courses added
  - **May 28**: Last day of classes before Memorial Day
  - **May 31**: Classes resume
  - **June 15**: Last day to withdraw
  - **June 29**: Summer 2005 Session A ends

- **Summer Session B**:
  - **April 4-8**: Advance Registration
  - **April 9-July 8**: Registration
  - **July 8**: Last day to register without a late fee
  - **July 11**: Classes begin; Late registration fee applies
  - **July 12**: Add/Drop period begins
  - **July 15**: Last day to drop classes with 100% tuition credit
  - **July 16**: Withdrawal period begins for dropped classes; late transaction fee applies for courses added
  - **August 12**: Last day to withdraw
  - **August 20**: Summer 2005 Session B ends

- **Summer Session E**:
  - **April 4-8**: Advance Registration
  - **April 9-May 17**: Registration
  - **May 17**: Last day to register without late fee
  - **May 18**: Classes begin; Late registration fee applies
  - **May 19**: Add/Drop period begins
  - **May 28**: Last day of classes before Memorial Day
  - **May 31**: Classes resume
  - **June 2**: Last day to drop classes with 100% tuition credit
  - **June 3**: Withdrawal period begins for dropped classes; late transaction fee applies for courses added
  - **July 13**: Last day to withdraw
  - **July 28**: Last day of classes

*The University is open and classes are held on Martin Luther King Day.

To afford an opportunity to all members of the University community, students, faculty, and staff who may desire to participate in the Freedom Walk celebrating Dr. Martin Luther King’s life and legacy, upon request, may be excused from any scheduled classes, office hours, meetings, etc. from 11:00 a.m. – 1:00 p.m. Temporary help, substitute instruction, rescheduling, etc. will be provided as needed. During this period, all mandatory activities such as exams, presentations or other graded activities will be deferred, although assignments may be made by e-mail for subsequent sessions.
# Academic Schedule 2003–2006

## Fall 2005 Semester

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 4-8</td>
<td>Advance Registration</td>
</tr>
<tr>
<td>April 9- August 31</td>
<td>Registration</td>
</tr>
<tr>
<td>August 30</td>
<td>Last day to register without late fee</td>
</tr>
<tr>
<td>August 31</td>
<td>Classes begin; late registration fee applies</td>
</tr>
<tr>
<td>September 1</td>
<td>Add/Drop period begins</td>
</tr>
<tr>
<td>September 3</td>
<td>Last day of classes before Labor Day recess</td>
</tr>
<tr>
<td>September 6</td>
<td>Classes resume</td>
</tr>
<tr>
<td>September 14</td>
<td>Last day to drop classes with 100% tuition credit</td>
</tr>
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<td>September 15</td>
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</tr>
<tr>
<td>November 23</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>November 23</td>
<td>Last day of classes before Thanksgiving recess</td>
</tr>
<tr>
<td>November 28</td>
<td>Classes resume</td>
</tr>
<tr>
<td>December 16</td>
<td>Last day of classes before final exams</td>
</tr>
<tr>
<td>December 19-23</td>
<td>Final exam week</td>
</tr>
<tr>
<td>December 23</td>
<td>Fall 2005 semester ends</td>
</tr>
</tbody>
</table>

## Spring 2006 Semester

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>October 31 - November 4</td>
<td>Advance Registration</td>
</tr>
<tr>
<td>November 5 - January 16</td>
<td>Registration</td>
</tr>
<tr>
<td>January 15</td>
<td>Last day to register without late fee</td>
</tr>
<tr>
<td>January 16</td>
<td>Classes begin; late registration fee applies</td>
</tr>
<tr>
<td>January 16</td>
<td>Martin Luther King Day Celebration*</td>
</tr>
<tr>
<td>January 17</td>
<td>Add/Drop period begins</td>
</tr>
<tr>
<td>January 27</td>
<td>Last day to drop classes with 100% tuition credit</td>
</tr>
<tr>
<td>January 28</td>
<td>Withdrawal period begins for dropped classes; late transaction fee applies for courses added</td>
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<tr>
<td>March 11</td>
<td>Last day of classes before mid-semester break</td>
</tr>
<tr>
<td>March 13-17</td>
<td>Mid-semester break</td>
</tr>
<tr>
<td>April 14</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>May 5</td>
<td>Last day of classes before final exams</td>
</tr>
<tr>
<td>May 8-12</td>
<td>Final exam week</td>
</tr>
<tr>
<td>May 21</td>
<td>Commencement</td>
</tr>
<tr>
<td>May 22</td>
<td>Spring 2006 semester ends</td>
</tr>
</tbody>
</table>

## Summer 2006 Semester

### Session A:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 3-7</td>
<td>Advance Registration</td>
</tr>
<tr>
<td>April 8- May 17</td>
<td>Registration</td>
</tr>
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<td>May 16</td>
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<tr>
<td>May 30</td>
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</tr>
<tr>
<td>June 14</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>June 28</td>
<td>Summer 2006 Session A ends</td>
</tr>
</tbody>
</table>

### Session B:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 3-7</td>
<td>Advance Registration</td>
</tr>
<tr>
<td>April 8- July 10</td>
<td>Registration</td>
</tr>
<tr>
<td>July 9</td>
<td>Last day to register without late fee</td>
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<tr>
<td>July 10</td>
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<td>August 4</td>
<td>Last day to withdraw</td>
</tr>
<tr>
<td>August 19</td>
<td>Summer 2006 Session B ends</td>
</tr>
</tbody>
</table>

### Session E:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 3-7</td>
<td>Advance Registration</td>
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<td>July 27</td>
<td>Summer 2006 Session E ends</td>
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</table>

The University reserves the right to make adjustments to the academic calendar as necessary.

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To afford an opportunity to all members of the University community, students, faculty, and staff who may desire to participate in the Freedom Walk celebrating Dr. Martin Luther King’s life and legacy, upon request, may be excused from any scheduled classes, office hours, meetings, etc. from 11:00 a.m. – 1:00 p.m. Temporary help, substitute instruction, rescheduling, etc. will be provided as needed. During this period, all mandatory activities such as exams, presentations or other graded activities will be deferred, although assignments may be made by e-mail for subsequent sessions.
Lawrence Technological University is an independent, co-educational accredited university founded in 1932 and offering over 50 academic programs at the associate, baccalaureate, masters, and doctoral degree level. The University is composed of Colleges of Architecture and Design, Arts and Sciences, Engineering, and Management. Approximately 5,000 students are enrolled in full-time, part-time, day, evening, credit, and non-credit programs.

Lawrence Tech combines the benefits of a close, caring, small college atmosphere with the academic depth and scope of a larger university. Lawrence Tech takes a personal approach to education, and the University attracts students who generally have made some big plans for themselves. They’re highly motivated students with a tremendous will to succeed, to excel, and to seek out the best in whatever they do.

Lawrence Tech has a reputation for excellence. Most students claim that the University’s programs are tough and challenging – programs that unapologetically demand commitment. At the same time, as a result of their educational preparation, Lawrence Tech graduates report (in numbers well above national norms) that they arrive in the workplace feeling prepared and ready to do their jobs.

Independent studies also confirm that Lawrence Tech students rapidly achieve placement success. In recent years, some 97 percent of graduates responding report finding career positions within a year. The American Society of Employers ranked Lawrence Tech first in its class as a preferred provider of graduates to Southeastern Michigan employers. Standard & Poor’s has historically ranked Lawrence Tech in the top third of all colleges and universities providing the leaders of America’s most successful businesses.

The heritage and educational philosophy of the University is reduced to just three words in the University motto, adopted shortly after Lawrence Tech was founded in 1932 – “theory and practice.” It means that Lawrence Tech seeks to explain not only why something should work, but how it works in real situations and applications.

Much of the student’s learning in this way will be gained directly from Lawrence Tech’s professors. Many Lawrence Tech faculty have years of successful industrial and professional experience in addition to academic credentials from some of the nation’s top universities and colleges. They’ve learned what succeeds in the “real” world, and they’ll try to make sure that students do, too.

In addition, there is unusually close interaction between the University and the professions that its students and graduates serve. Assuring that academic programs provide students with the types of contemporary skills that employers value is a special goal.

Another attribute is the University’s location in close proximity to some of the world’s leading industrial, technological, business and scientific enterprises. The relationship is more than geographic – it assures the University’s participation in “cutting edge” advancements and “front office” accessibility by students interested in co-op, part-time, and networking opportunities. Over 200 Fortune 500 corporations have headquarters or major operations within a half-hour’s drive of Lawrence Tech’s campus.

Finally, Lawrence Tech students are strongly encouraged to interact with the professional world throughout their academic program. Dozens of professional societies are active on campus and help students network with men and women already working in specific fields. Many of the academic programs also require participation in profes-
sional projects that seek to solve real problems facing practicing architects, engineers, managers, scientists, and others. The projects expose students to a host of real world challenges, and Lawrence Tech students regularly earn top awards in competitions that pit them against students from other top colleges and universities throughout the hemisphere.

There is an intangible “spirit” at Lawrence Tech — an earnest spirit of student and faculty enthusiasm for learning and living, and a spirit of motivation and desire to excel. It’s not confined to the classroom or the laboratory; it’s an all-encompassing feeling — both a reality and an ideal. Consider Lawrence Tech. Share the spirit!

MISSION, VISION AND VALUES

Lawrence Technological University was founded as an independent non-profit institution of higher learning.

Linking theory and practice with advanced learning technologies, Lawrence Technological University’s mission is to provide superior undergraduate, graduate, and lifelong learning for leadership, professional achievement and civic excellence.

Toward that end, the following purposes have been established:

1. To maintain programs at a high level of contemporary theory and practice using leading-edge learning technology, student projects, and distinctive treatment of general education.
2. To offer high quality education in the form of accessible, convenient, technology-based, personal and small class instruction.
3. To offer a core/foundation liberal arts education designed to cultivate students’ ability to think critically, to solve problems creatively, and to make decisions that will benefit themselves and society.
4. To respond to and serve industry, the professions and the community by providing quality innovative programs and continuing professional development.

Lawrence Technological University’s vision is to be the school of first choice in the Midwest for technology-based professional education and be recognized as a partner to industry, business, and government.

LAWRENCE TECH’S STATEMENT OF VALUES

We believe in open, honest communication within an active learning environment that:

1. Is committed to academic excellence, diversity, and the development of the whole person.
2. Anticipates and meets the needs of our constituents: students, faculty and staff, alumni, donors, and industry neighbors.
3. Creates leadership opportunities for the growth and development of a diverse faculty and staff.
4. Links theory and practice with innovative programs and delivery.

ACCREDITATION AND MEMBERSHIPS

Lawrence Technological University is accredited by The Higher Learning Commission and a member of the North Central Association, www.ncahigherlearningcommission.org; phone 312.263.0456. The NCA accreditation report is on file in the University’s library and is available for public review by patrons. Various graduate and undergraduate degree programs in architecture, interior architecture, illustration, business administration and management, chemistry, and engineering are additionally accredited through appropriate national professional agencies.

Lawrence Tech’s institutional memberships include the American Society for Engineering Education, the Association of Collegiate Schools of Architecture, the Association of Collegiate Business Schools and Programs, and the Association of American Colleges and Universities. The University is also a member of the American Council on Education; Automation Alley; the College Board; Association of Governing Boards of Universities and Colleges; International Assembly for Collegiate Business Education; Association of Independent Colleges and Universities of Michigan; National Association of Independent Colleges and Universities; Council for Higher Education Accreditation; ESD, the Engineering Society; National Financial Aid Association; Michigan Student Financial Aid Administrators; Midwest Association of Student Financial Aid Administrators; and the National Association of Student Financial Aid Administrators. In addition, the University has membership in the Michigan and American Associations of Collegiate Registrars and Admissions Officers; Southfield, Greater Detroit, and U.S. Chambers of Commerce; Michigan, Ohio, and National Associations of College Admissions Counselors; American Association of University Administrators; Association of College Administration Professionals; Advanced
Acceptance Program; and the Michigan and National Associations for Foreign Student Affairs.

Faculty and staff are additionally members of a wide variety of local, state, and national professional organizations appropriate to their disciplines. Professional organizations with active student chapters at Lawrence Tech are listed in the Student Life section of this Catalog.

**CLASS AND FACULTY**

Lawrence Tech’s moderate size encourages close interaction between students, faculty, and staff. Classes are generally small, especially for upper-classmen, and individual initiative is stressed.

Lawrence Tech has about 300 full and part-time faculty. Exemplifying the University motto of “theory and practice,” in addition to academic experience, many also bring a wealth of personal “real world” research, business, or industrial experience to the classroom or laboratory. In addition to courses taught by Lawrence Tech’s full-time professional faculty, it isn’t unusual for students in appropriate disciplines to take classes taught by adjunct faculty who are successful corporate executives, practicing accountants, managers, entrepreneurs, engineers, architects, attorneys, and scientists. Such exposure is deliberate on the part of the University, and seeks to help students develop an awareness of the most current “real world” problem solving applications of their academic studies.

Lawrence Tech students find their professors are normally easily accessible, and that they are eager to discuss individual questions, academic progress, or concerns outside of class. The University has a tradition of an “open door” policy with faculty, department chairpersons, deans, the president, and other administrative staff.

**DIRECT STUDENT INTERACTION**

The successful Lawrence Tech student generally arrives on campus with a full measure of ability and self-initiative. Self-initiative is Lawrence Tech’s term for a proper combination of motivation and self-reliance. These students appreciate the institutional position that the University exists for, and interacts with, the student -- not relatives, spouses, or friends wishing to represent them. The fact that Lawrence Tech students are of a maturity that requires no such representation helps ensure that they are prepared for responsible full or part-time employment during their academic career and, following graduation, for professional employment or continued study.

**CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT**

Continuing Education and Professional Development are vital components in career development and are reflected in today’s critical need to prepare for the future. Lawrence Tech’s Division of Continuing Education and Professional Development assists organizations and individuals in maintaining their competitive edge in today’s marketplace by increasing skills, knowledge, and productivity, be they focused on technical, production, managerial, administrative, or executive issues.

Lawrence Tech offers many non-degree special academic opportunities. Services range from one-time on-site training sessions to customized development of entire training curricula. The Division utilizes a range of resources calling upon the extensive skills and talents of a variety of consultants, instructors, curriculum designers, trainers, and educational developers, whose services are complimented by a support staff which works closely with every client.

Working with the Colleges of the University, the Division designs, develops, and delivers non-degree credit programs in six major areas which include: engineering, management, architecture, computers, communication skills, and insurance studies. Other services include:

- Public programs in the form of seminars, workshops, conferences, and symposia which serve the professional development needs of alumni and the University’s constituent audiences;
- Employee development and training programs which are typically offered off-campus to business, industry, government, and professional associations;
- On-campus meeting services office that welcomes hundreds of visitors to campus each year for corporate, business, and professional association meetings.

For further information on professional development programs and/or related meeting services, contact the Division at 248.204.4050.
Lawrence Technological University’s park-like 120-acre campus continues to expand and now includes ten major buildings. An exciting program of improvements continues throughout the campus, and includes development of a new Student Life and Service Center that will provide convenient, centralized student service space, meeting rooms, and more.

Lawrence Tech’s location is considered by many to be one of the University’s greatest assets, particularly taking into account the wealth of nearby opportunities for students to network with practicing professionals, participate in career related organizations, and find full- and part-time employment during college and after graduation.

Located near the exact center of population of southeastern Michigan, the University is conveniently situated in the Oakland County city of Southfield, a suburban community of approximately 75,000 people. For visitors travelling by car, the campus is about 30 minutes northwest of downtown Detroit. It is also about 30 minutes northeast of Detroit Metropolitan Airport. Lawrence Tech is easily reached via the interstate highway system and is situated at the intersection of West Ten Mile Road and Northwestern Highway (M-10, the Lodge Freeway), just south of Interstate 696.

The campus is at the center of the world of real work, real problems to be solved, and real possibilities for a full professional and cultural life. Southeastern Michigan is a hub of American business and industry. It is a manufacturing and corporate center, the site of some of the world’s outstanding technological accomplishments, and a focal point for cultural activities and recreation.

Within a 15-mile radius of campus are world headquarters for many of the nation’s leading research, industrial, and manufacturing firms. More than 200 Fortune 500 companies are headquartered or have
major operations here. And while the area’s economy is substantially more diverse than the days when the region was dubbed the world’s auto capital, fully one third of all U.S. auto production still takes place within 70 miles of the campus -- in some of the planet's most sophisticated, highly automated, and innovatively managed work environments.

Lawrence Tech is part of the Oakland County/Automation Alley SmartZone, one of the state’s foremost concentrations and magnets of high tech business and enterprise. The University is also the designated Small Business Development Center for Oakland County, with specialization in technology.

Oakland County ranks as the third wealthiest county in the nation among counties with populations in excess of one million. Retail sales in the county alone exceed those of nearly 20 individual states. The county is a leading center of international commercial activity and home to some 425 foreign-owned firms from 22 countries. About 35 percent of Michigan’s R&D firms are here, and more than 50 percent of the nation’s automotive supplier technical centers.

Robotics firms in the county account for more than half of U.S. robotic sales.

Nearby recreational opportunities abound – over 450 lakes, five ski areas, nearly 30 public fishing sites, and more golf holes per capita than any place else in the country. Major entertainment facilities within a half hour drive include Pine Knob and Meadowbrook outdoor music theaters, the Pontiac Silverdome, the Palace of Auburn Hills (home of the NBA Pistons), Joe Louis Arena (home of the NHL Red Wings), Ford Field (home of the Detroit Lions), and Comerica Park (home of the Detroit Tigers). Additional attractions include Cranbrook Museums, the Detroit Zoo, the Detroit Institute of Arts, Historical Museum, Motown Museum, Henry Ford Museum and Greenfield Village, Detroit Science Center, Wright Museum of African-American History, and more.

Lawrence Tech’s University Technology and Learning Center, opened in 2001, is a $20 million 87,000 sq. ft. building housing a variety of technology labs and studios. It also houses the Welcome Center, the University Gallery, Maibach Inter-Faith Lounge, Lear Auditorium, Denso Interactive Center, the Laptop Help Desk, Media Services Office, and more. The building connects on either end to the Architecture and Engineering Buildings.

The Architecture Building, completed in 1962, houses classrooms, studios, the College of Architecture and Design and the Lewis Veraldi Center for Educational Technology. A 325-seat auditorium is also located here, as well as a gallery for changing exhibits.

The Wayne H. Buell Management Building is a 115,000 sq. ft. structure dedicated in memory of Lawrence Tech’s third president. Opened in 1982, it houses the College of Management, Library, Dining Commons (Café Lawrence), and Bookstore. A university lounge and the offices of the President, Provost, Admissions, Dean of Students, Career Services, Cooperative Education, Vice President for University Advancement, and Marketing and Public Affairs are also here. A fully enclosed three-
story atrium hosts a variety of special events as well as a copy center, postal kiosk, and ATM.

Lawrence Tech’s Engineering Building was most recently expanded in 1987, and was the first building on the Southfield campus when it opened in 1955. The building houses offices for the College of Engineering, Vice President for Finance and Administration, Business Services, and Personnel Services. A Student Service Center offers “one stop shopping” for students needing assistance from the Cashier, Registrar, or Financial Aid and Veteran’s Offices. In addition, the structure houses classrooms and laboratories.

The Science Building, opened in 1967, was extensively renovated and equipped with upgraded computer and multi-media equipment in 1999. It houses classrooms, laboratories, and offices for the College of Arts and Sciences – including the Departments of Natural Sciences; Mathematics and Computer Science; and Humanities, Social Sciences and Communication. The Academic Achievement Center, and the Edward Donley Computer Center are also here. A 303-seat auditorium is located at the south end of the building.

Lawrence Tech’s Student Housing Centers South and North, opened respectively in 1977 and 2002, provide modern, fully furnished air-conditioned apartment units and together house nearly 600 students. See the Student Housing section of this Catalog for additional information.

The Don Ridler Field House, Corporate Services Complex, and Applied Research Center, added in 1987, together offer a wide variety of recreational, meeting, applied research and educational facilities. The complex includes offices for Continuing Education and Professional Development, Small Business Development Center, Student Activities, and student organizations and clubs, including the Student Government and Interfraternal Council. Ridler Field House includes a 1,500-seat gymnasium, exercise track, weight and conditioning room, saunas, racquetball courts, and locker facilities.

The Presidents Conference Center, built in 1959 and substantially upgraded in 1996, offers facilities for group meetings and special events.

The Maintenance Building provides storage for supplies, maintenance and landscape equipment.

Outdoor Athletic Facilities include softball diamonds, and football and soccer practice fields. Plenty of free, lighted, paved parking is available on campus. There are no restrictions limiting student use of automobiles; however, student vehicles must display a current registration permit (available from the Student Service Center,) and students are expected to obey the University’s parking and speed regulations. Designated visitor and handicap parking is available near all buildings.

The Gregor S. and Elizabeth B. Affleck House, designed by Frank Lloyd Wright and completed in 1941, was given to the University in 1978 by the late Afflecks’ children, (Mrs.) Mary Ann Lutomski and Gregor P. Affleck. The home has been restored by the University and is located in the nearby City of Bloomfield Hills. It is considered an outstanding example of Wright’s work. The Affleck House is managed by the College of Architecture and Design.
A university education should be more than credits, courses, and examinations. Lawrence Tech seeks to offer a total experience of living and learning encompassing recreation, entertainment, student government, athletics, culture, spiritual, and professional growth.

Students may involve themselves in a wide range of campus activities, coordinated by the Dean of Students and Student Activities Offices, Student Housing, and others. Campus organizations include over 40 departmental clubs, intramural athletics, religious organizations, campus newspaper, fraternities, and sororities. Hobby-oriented clubs represent additional interests. Student Government and student chapters of professional societies offer leadership and service opportunities.

**STUDENT GOVERNMENT**

The Student Government was organized by students to assist the University administration in maintaining a progressive, effective, and well-organized program of student activities. With representatives from all recognized campus groups, it manages a substantial budget and appropriates funds for many diverse student activities. For further information, see the Student Handbook.

**STUDENT PUBLICATIONS**

Student-oriented publications include the Tech News, the twice monthly campus newspaper published for students and staff, and the annual literary magazine, Prism. Both publications encourage students interested in writing, photography, graphics and design to become active.

**CAMPUS ORGANIZATIONS**

Professional organizations active on campus include chapters of: American Institute of Architecture Students, American Chemical Society, American Society of Civil Engineers, American Society of Interior Designers, American Society of Mechanical Engineers, Associated General Contractors of America, Association for Computing Machinery, the Engineering Society of Detroit, Institute of Electrical and Electronic Engineers, Michigan Society of Professional Engineers, National Association of Home Builders, National Society of Black Engineers, Society of Automotive Engineers, Society of Manufacturing Engineers, Society of Physics Students, Society for Technical Communication, and Society of Women Engineers.

Honor societies include Lambda Iota Tau, Eta Kappa Nu, Pi Tau Sigma, Chi Epsilon, Sigma Pi Sigma, Tau Beta Pi, and Tau Sigma Delta.

Interest-based organizations on campus include Artists Guild, Campus Crusade for Christ, Chinese Students Association, Detroit Metropolitan High School Mathematics and Computer Club, LTU Musician’s Society, Student Alumni Council, and Wireless Society.

The number of student clubs, organizations, and club sports varies each year depending upon student interest. One of the best aspects of a moderately-sized university like Lawrence Tech is that students needn’t “wait in line” to become involved. Students interested in starting a club should contact the Student Activities Office.

**SPECIAL EVENTS BOARD**

Students Programming Activities Monthly (S.P.A.M.) has a mission to stimulate and promote campus life at Lawrence Tech by providing a variety of entertainment and special events each month throughout the semester. Events include, casino nights, comedians, musicians, motivational speakers, hypnotists, magicians, virtual reality rides and an array of novelty acts. The board is a member of the National Association for Campus Activities (NACA) and attends the regional and national conference each year.
FRATERNAL ORGANIZATIONS

Greek-letter social organizations include the alpha chapter of Phi Kappa Upsilon, Sigma Phi Epsilon, Sigma Pi, and Theta Tau fraternities, and Alpha Kappa Alpha, Chi Omega Rho, Delta Phi Epsilon, and Delta Tau Sigma sororities. The Interfraternal Council coordinates and sponsors several campus activities each year based on student interest including Greek Week, Spirit Week, and service projects.

ATHLETICS AND INTRAMURALS

Intramural athletic programs, free to all students, include football, softball, basketball, indoor soccer, racquetball, wallyball, and volleyball. Club sports allow students to compete with clubs and varsity teams from other colleges and universities. Soccer, golf, hockey and volleyball are among club sports offered in recent years if student interest is sufficient to field teams.

STUDENT CONDUCT

Information regarding Lawrence Tech's Students Code of Conduct is found at www.ltu.edu. Hard copies of the code are available at the Dean of Students Office, Buell Management Building, M108.

NOTICE OF NON-DISCRIMINATORY POLICY

Lawrence Technological University adheres and conforms to all federal, state, and local civil rights regulations, statutes and ordinances. No person, student, faculty, or staff member will knowingly be discriminated against relative to the above statutes. Lawrence Technological University is an equal opportunity employer. Direct inquiries regarding non-discriminatory policies to: Office of Student Affairs, 21000 W. Ten Mile Rd., Southfield, MI 48075-1058, 248.204.4100.

SEXUAL HARASSMENT

It is the policy of Lawrence Technological University to maintain an academic and work environment free of sexual harassment for students, faculty, staff or any other constituency. Sexual harassment is contrary to the standards of the University community. It diminishes individual dignity and impedes equal employment and educational opportunities and equal access to freedom of academic inquiry. It will not be tolerated at Lawrence Technological University. Brochures available in the Personnel Office and the Office of Student Affairs explain what constitutes harassment, remedies and resources on campus, reporting procedures, and penalties.

PARTICIPATION IN THE U.S. DRUG PREVENTION PROGRAM

Lawrence Technological University is in compliance with all provisions of the U.S. Department of Education Drug Prevention Program, which is a condition of the University’s eligibility to receive federal funds or any other form of federal financial assistance.

Applicable policies are provided in sections 16.0 and 16.1 of the Staff Handbook, section 2.18 of the Faculty Handbook and in this section of the Catalog. The University specifically prohibits the unlawful possession, use or distribution of illicit drugs and alcohol by students and employees on its property or as a part of any of its activities. Use of alcoholic beverages at any University function requires the approval of the president.

Any employee or student found to be in violation of University policy regarding drugs or alcohol will be subject to disciplinary action up to and including dismissal in accordance with applicable disciplinary procedures.

Possession, use or distribution of illicit drugs, possession or consumption of alcoholic beverages by individuals under 21 years of age, and distribution of alcohol without a license or permit issued by competent legal authority are violations of local, state and federal laws. It is the policy of
the University to cooperate fully in any prosecution based on violation of these laws and to report all known violations to the appropriate law enforcement agencies. A variety of serious health risks are associated with the use of illicit drugs and the abuse of alcohol. These include permanent damage to the liver, brain and other vital organs, heart damage or malfunction including sudden death, and accidents caused by impaired judgment or abilities. Individuals who may have a drug dependency or alcohol abuse problem are advised to contact the Oakland County Drug and Substance Abuse Center, phone 248.858.5200.

LIABILITY DISCLAIMER

Lawrence Technological University shall not be liable for any injuries to, or property damage or loss suffered by, any student regardless of cause. This disclaimer of liability shall apply to, but not by way of limitation, the following:

• Any injury or damage incurred on property owned by or under the control of the University, or its subsidiaries, such as classrooms, apartments or other housing, any other structures, all common areas and grounds, and vehicles;
• Any injury or damage incurred as a participant, spectator or otherwise in any intramural or intercollegiate or other event or contest, athletic or otherwise, or while in transit thereto or therefrom;
• Any injury or damage suffered while engaged in or attending a classroom or related activity, whether required or elective, and regardless of cause;
• Any injury or damage suffered by reason of theft, fire, damage by the elements, or other casualty;
• Any injury or damage suffered by reason of any act or omission of any University trustee, officer, member of the faculty or staff, employee, contractor or student.

By applying for admission or readmission to the University, or by continuing their enrollment with the University for a subsequent semester, students accept the foregoing disclaimer and agree to be bound thereby. Emergency referrals are made to community agencies. Any expenses incurred are the responsibility of the student.

AFTER GRADUATION

Lawrence Tech alumni include a distinguished group of engineers, architects, scientists, business executives, managers, technicians, attorneys, physicians, governmental officials, educators, and others holding key positions throughout the United States and around the world. Standard & Poor’s has historically ranked Lawrence Tech in the top third of all colleges and universities that provide the leaders of America’s most successful companies. About 80 percent of Lawrence Tech’s over 22,000 degree-holding alumni reside in Michigan and the Midwest, but alumni also live in nearly every state and territory, as well as in Aruba, Australia, the Bahamas, Bermuda, Brazil, Canada, Chile, China, Colombia, Ecuador, England, France, Germany, Greece, Guyana, Hong Kong, Iran, Ireland, Israel, Jamaica, Japan, Jordan, Lebanon, Malaysia, Mexico, the Netherlands, Nigeria, Norway, Pakistan, Peru, Saudi Arabia, Scotland, Singapore, Sweden, Taiwan, Thailand, United Arab Emirates, Venezuela, and Zambia.

Lawrence Tech’s Alumni Association is the international forum for active graduates. The Association hosts a full service Website, www.ltu.edu/alumni, providing access to everything from lifetime e-mail accounts and events calendars to job search assistance. The Association holds meetings and sponsors a variety of activities and services for members in the Southeast Michigan area, and chapters elsewhere in Michigan and in Arizona, California, Colorado, Florida, Georgia, Illinois, Indiana, North Carolina, Ohio, and Texas also meet regularly. Several chapters based on academic interest are also active. The Alumni Relations Office coordinates alumni activities and serves as a campus liaison for alumni worldwide.
All new students are expected to attend orientation sessions prior to or during their first semester on campus. During these sessions student opportunities, responsibilities and regulations are presented, and registration is completed. A number of University counselors are available for academic advice, counseling, and registration assistance.

Counselors working with the Dean of Students supplement the academic advising offered by the various colleges. The Coordinator of the Academic Achievement Center also works with the colleges to coordinate services for handicapped students and tutorial services. Contact the appropriate academic department or the Academic Achievement Center for information.

The Academic Achievement Center (AAC) is a joint initiative between the College of Arts and Sciences and the Office of Student Affairs. This support service is free to all students, staff and faculty. The AAC’s primary function is to provide students with tutoring services for the core classes in mathematics, computer science, chemistry, physics and English. All tutoring is by appointment, using Lawrence Tech’s on-line appointment system. Exceptions are all day Wednesday, and Saturday morning, which are reserved for walk-in tutoring (no appointment necessary.) The AAC is located on the first floor of the Science Building. Hours of operation are Monday through Thursday, 8 a.m.-8 p.m., and Friday 8 a.m.-4:30 p.m. Summer hours vary.

A Student Service Center offering extended hours to assist with Business Services, Cashier, Financial Aid, and Registrar activities is located in the lobby of the Engineering Building.

Counselors in the Admissions Office (M376) are available to answer any questions regarding admissions policies, procedures, or course credit transfers.

An ATM cash machine is located in the atrium of the Buell Management Building.

The University Bookstore, located in the atrium the Buell Management Building, offers books, instruments, supplies, software, greeting cards, snack items, and a wide variety of other items for purchase. A spirit shop features clothing, gifts, and distinctive custom signature items emblazoned with Lawrence Tech’s name.

All campus facilities are open Monday-Friday from 7 a.m. to 11 p.m. Students wishing to use facilities after normal hours must submit a usage authorization request form with their professor, instructor, or faculty advisor, who, in turn, submits the form to the appropriate dean or department chairperson. The form must then be forwarded to the directors of Campus Facilities and Security. During study days finals most university facilities remain open to accommodate individual and group study.

The Career Services Office facilitates the job search process by assisting students and alumni in their search for full or part-time employment including internships. Services include on-campus interviews, job postings, and job fairs. In addition, counseling and assessments are available for a variety of career development needs including job search strategies, interviewing skills, and resume writing. An on-line resume service is provided for students and alumni.
COMPUTER RESOURCES

Lawrence Tech’s technology environment seeks to assure that students are well prepared and positioned to take full advantage of advanced learning opportunities, greater access to educational resources, and ultimately, are provided a competitive edge in the workplace. Lawrence Tech’s computer resources can be tremendously helpful to students as they learn, retain, analyze, present, use, and exchange complex technological and graphical information.

Lawrence Tech’s comprehensive e-learning and services portal, my.ltu.edu, offers an expanding variety of resources and conveniences. Among them is Blackboard, a comprehensive and flexible e-learning software platform that delivers the University’s course management system, customized institution-wide portals, online communities, and an advanced architecture that provides for Web-based integration with the University’s administrative systems.

The University provides considerable resources for staff and faculty training through the Veraldi Instructional Technology Resource Center (VITRC). VITRC enhances the teaching and learning process in the university community. It promotes the integration of emerging technology tools into classroom instruction. The University also provides other resources such as enhancing a service infrastructure, and making extensive improvements to campus facilities that allow students to utilize computer technology to their best advantage.

Lawrence Tech provides Michigan’s first campus wide wireless system for laptop computers, allowing connectivity to the University’s network and the Internet2 from anywhere on campus. In addition, selected classrooms and all the architecture studios have port ethernet broadband connectivity through laptop computers.

Lawrence Tech also offers a variety of computer laboratories and resources. The University’s Edward Donley Computer Center (EDCC) supply all registered students with free, required computer accounts. The EDCC’s client servers central processing units offer extensive and protected disk storage. All students, faculty, and staff may access personal accounts on this system from their laptop computer, a campus terminal or microcomputer, or from off campus.

The goal is to enjoy the best of both worlds – the speed and graphics capability of single user PC’s, and the seamless connectivity of the central system’s worldwide Internet communication. The combination extends Lawrence Tech’s learning experience to innumerable subjects via the Internet. A fiber optic “backbone” provides cutting edge technology and high speed computing and media access to the entire campus.

Training sessions, self-paced study courses, and other online assistance help students learn to use the computer – these aids in addition to programming classes. Electronic mail provides communication between students, faculty, and administrators, and is considered the official means of University communication. Professional state-of-the-art software is used by students and faculty in their fields of expertise. In addition, word processing, spreadsheet, and graphics programs are available along with job search services for students.
services from the Career Services Office.

Numerous high-powered PC workstations loaded with appropriate software are available in campus labs on a first come, first served basis. Generally, these are “open labs,” although occasionally, a lab may be reserved by an instructor for a class period. Reserved lab hours, when in effect, are posted.

COUNSELING

A wide variety of academic and personal counseling is offered on campus, aimed at helping students succeed in their studies, develop study skills, and cope with crisis, stress, or other difficulties. The Office of Student Affairs and the dean of students oversee many counseling activities. Each of the colleges also offer academic counseling and tutoring. (See Student Affairs section.)

DISABLED STUDENTS

The Office of Student Affairs, 248.204.4100, and the Academic Achievement Center, Disability Services Coordinator, 248.204.4120, (TDD 248.204.4117,) coordinate Lawrence Tech’s compliance with Sections 503 and 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. The University does not discriminate against students with disabilities in recruitment, admission, or treatment after admission. In addition, the University makes reasonable accommodations to permit students with disabilities to fulfill academic requirements and provides effective auxiliary aids to ensure that they are not excluded from programs because of their disabilities. Eligibility for accommodations is determined on an individual basis. To determine eligibility, contact the AAC Disability Services Coordinator.

Students who believe that the University may not be meeting these responsibilities or who believe that they have been otherwise discriminated against based upon their disability may contact the Section 504 officer at the Office of Student Affairs, 21000 W. Ten Mile Rd., Southfield, MI 48075-1058.

DUPLICATING FACILITIES

Duplicating and binding services are available in the Copy Center in the Buell Management Building atrium at a nominal charge. There are also pay photocopying machines in the library, Engineering Building lobby, and Architecture Building.

FAX SERVICE

Fax service (send only) is available at the Bookstore, located in the Buell Management Building.

FOOD SERVICE

Cafeteria service is offered during posted hours at Café Lawrence located in the Buell Management Building. Vending machines dispensing a variety of hot or cold foods are also in operation at several campus locations.

HELP DESK

Located at the Welcome Center in the University Technology and Learning Center, the Help Desk provides assistance for students with Lawrence Tech TechBook wireless laptop computers. Call 204.4080 or e-mail to pchelp@ltu.edu.

INTERNATIONAL STUDENTS

International students may receive assistance from the Office of International Student Affairs, located in the Buell Management Building, room M130.

LIBRARY

The Lawrence Tech library, located on the first level of the Buell Management Building, houses a broad selection of books, periodicals, CD-ROMs and internet database search systems, and microforms selected to enhance the curriculum areas of the University. The library boasts an attractive garden area providing year-round greenery.

The staff of professional librarians, on duty during all scheduled hours, is skilled in locating information at Lawrence Tech and at numerous other institutions, and provides individualized and group instruction in how to use the library efficiently.
Students have full access to the stacks for browsing and independent research, and can get reference assistance from a librarian whenever the library is open. An on-line library information system is accessible via my.ltu.edu. With a wide range of information as well as access to books at Lawrence Tech, this information is selected to serve the needs of the university curriculum and is not available on the regular Internet. When it is desirable to explore collections elsewhere, the library has agreements with many local and outstate academic and public libraries for direct borrowing privileges, or in some cases, through a special arrangement. As an alternative, materials can be borrowed from libraries across the nation through a sophisticated interlibrary loan program available through the Lawrence Tech library.

Among its unique resources, the library houses the handsome and self-contained 3,000 volume personal and professional library of the late renowned architect Albert Kahn, and has a complete collection of SAE papers since 1965 on microfiche. Collection strengths include engineering, architecture, management, and technology.

**MOTOR VEHICLES AND PARKING**

All students may have motor vehicles on campus. Plenty of free, paved, lighted parking is provided for students, visitors, faculty and staff. However, parking is by permit only. Student and faculty vehicles must display a current Lawrence Tech registration decal available from the Service Center or Campus Safety. Lawrence Tech Security is authorized to levy fines on tickets issued for improper driving or parking. Campus motor vehicle parking and traffic regulations appear in the Student Handbook. The University is not liable for accidents, damage, or theft.

**OPEN DOOR POLICY**

The president’s door is always open to students. Usually after consultation with instructors, department chairs, college deans, dean of students, provost, or other responsible administrative offices, students will find that any concerns will be satisfactorily addressed. If not, students may contact the president’s executive assistant, who will prepare a briefing and arrange a convenient appointment between the student and the president.

**POSTAL AND PACKAGE SERVICES**

Postage stamps are available for sale at the Student Service Center in the lobby of the Engineering Building. Mailboxes for outgoing U.S. mail are located in the lobby of the Architecture, Engineering, Management, and Science Buildings. A Federal Express kiosk is located at the north entrance to the Buell Building Atrium.

**DON RIDLER FIELD HOUSE**

Field House facilities include a gymnasium, weight and conditioning rooms, exercise track (1/11th mile), four racquetball/wallyball courts, and men’s and women’s locker rooms/shower and saunas. The Field House is open during posted hours, seven days a week.

**SAFETY AND SECURITY**

Lawrence Tech is patrolled by a safety team 24 hours a day. But because no metropolitan area is immune from criminal activity, all students should take an active role in assuring personal safety. Report suspicious persons or activities immediately to Campus Safety (available 24 hours a day) by picking up any campus extension phone and dialing ext. 3945. For emergencies, dial *911 (Star-9-1-1) to be connected to Lawrence Tech Security which will contact the appropriate emergency service. From campus pay phones, dial 911 for municipal police, fire, or medical emergencies.

Lawrence Technological University, in full compliance with the Federal Crime Awareness and Campus Security Act of 1990, makes security information available to Lawrence Tech’s students, faculty and staff, as well as admissions applicants and newly hired employees. Statistics on campus crime may be examined at the
Safety Office. Campus safety and security statistics for the last academic year, are available at www.ltu.edu.

STUDENT AFFAIRS OFFICE

The Office of Student Affairs provides services to help students successfully complete their chosen curricula, support personal and professional development, and offers opportunities for fellowship, fun, and rewarding college experiences. The office is located in the Buell Management Building, M108, 248.204.4100.

Student Affairs serves as the central resource for personal, confidential, and non-biased assistance in addressing any concerns a student may have regarding his or her rights and responsibilities as a member of the campus community. Services offered by the Office include:

• Assistance for students who have a mental or physical impairment that might affect their performance and ability to succeed in the classroom. Students with documented disabilities may request modifications, accommodations, or auxiliary aids that will enable them to participate in and benefit from all educational programs and activities. Every attempt will be made to make reasonable accommodations to the University environment. You may direct dial a TDD phone at 248.204.4117, located in the Academic Achievement Center.

• Personal counseling (including crisis counseling) is available, as well as psycho-educational services. Students are encouraged to discuss current issues (sexual harassment, date rape, alcoholism, etc.) with a counselor in complete confidentiality.

• Social events to encourage students to interact with other students on campus. Popular programs include: the fall Welcome Back Picnic, the New Student Convocation, Dean’s List Recognition Event, special entertainment evenings, “Coffee on Us,” movie nights, Film Festival, housing discussions, and “Pushing Honey Through” awards for supportive family members.

• Assistance with study skills development and strategies to become self-efficient learners is available in the counseling office. In addition, study skills workshops and computer instruction tutorials may be suggested to help students improve their academic performance. (See Academic Achievement Center.)

STUDENT HEALTH INSURANCE

A 12-month health and accident insurance policy is available to all full-time students at a reasonable cost. Contact the Business Services Office. Students residing in University Housing are advised to secure tenant’s insurance on personal possessions.

STUDENT LOUNGES

Student lounges are located in every building; in the fireplace area of the Engineering Building; in the lower level of the Architecture Building; in the foyer of the Science Building, and in the atrium of the Buell Management Building.
Lawrence Tech is focused on creating an environment that develops the “whole person.” Two modern, apartment-style residential centers accommodate nearly 600 students on campus. Campus living is more than just convenient – it’s a terrific way to take advantage of the full range of academic, social, and other opportunities that are an important part of your university experience.

Each of Lawrence Tech’s housing centers feature both one- and two-bedroom fully-furnished suites that include full kitchens, full baths, living and eating spaces, and many other amenities. The $12 million Student Housing-North, opened in 2002 near the campus center, contains four floors of suites anchored by central community rooms. Student Housing-South opened in 1977 and has undergone some $3.1 million in refurbishing, including new paint and carpeting. It contains seven floors of suites overlooking the south campus and a nature preserve/wetland.

In addition to housing staff who assist you with your residential needs, each building is home to community leaders - more experienced students who work with you to help plan activities for residents and who “know the ropes” about campus resources, personnel, and other attributes that can maximize your Lawrence Tech experience.

Neighborhood shopping centers are located nearby, as are restaurants, banks, service stations, dry cleaners, and other services. Two regional shopping malls are within a five-minute drive and the entire metropolitan area is easily accessible via the nearby Lodge (M-10) and I-696 freeways. Taxis and limited bus service serves the area. The recreational facilities of Lawrence Tech’s Don Ridler Field House and outdoor playing fields are only a short walk or bike ride away. The recreational facilities of the nearby Southfield Civic Center are available to residents and include tennis courts, handball courts, a nine-hole golf course, Olympic-size pool and indoor ice rink.

For tours, rates, and other information about Lawrence Tech’s residential options, contact the Student Housing Coordinator, 248.204.3951.

OTHER HOUSING

The Southfield and northern metropolitan area abounds with a variety of privately owned rental housing, ranging from rooms, small homes or duplexes available from individuals, to large complexes containing hundreds of units. Most require 12-month leases.

RENTERS INSURANCE

Students residing in University Housing, or in locations other than the family home, are advised to secure tenant’s insurance on their personal belongings and furnishings to protect against loss, theft, or damage.
It was a firm belief in the future that motivated Russell E. Lawrence to found a university in 1932 — in the midst of the economic chaos of the Great Depression. While less farsighted individuals made predictions of gloom, Russell Lawrence and his brother, E. George Lawrence (who led Lawrence Tech during its formative years from 1934 to 1964) turned a dream of preparing students for leadership in the new technical era into reality. Lawrence Tech continued to prosper and accelerate its growth under the guidance of Wayne H. Buell, president from 1964 to 1977, and chairman of the board and CEO until 1981.

Several new buildings, graduate degrees, and massive growth of computer facilities marked the presidency of Richard E. Marburger, who served as president from 1977 to 1993 and also served as chairman of the board of trustees and chief executive officer from 1981 to 1993.

Charles M. Chambers was named president and chief executive officer July 1, 1993, and has overseen significant enhancement of the University’s international reputation as a distinguished center of technological education and research, through such efforts as the Pacific Rim scholars program, the national alumni service campaign, and the minority careers development initiative. A Strategic Plan and Campus Master Plan have been adopted to guide the University well into the new century, and other recent achievements include construction of the University...
Technology and Learning Center, Student Housing-North, establishment of a Faculty Senate, conversion of the computer system to a client server model with full Internet2 connectivity and online library, Michigan’s first wireless laptop campus, and expanded bookstore, dining and student activity facilities.

The University was called Lawrence Institute of Technology until January 1, 1989, when the present name was approved by the State of Michigan, more clearly describing the undergraduate and graduate mission of the institution.

Lawrence Tech was founded on the principle that every person should have the opportunity for a college education. There were no restrictions on entering students relating to race, sex, color, creed or national or ethnic origin – only the requirement that students qualify for admission and have the desire to succeed. Working students could earn a baccalaureate degree by attending evening programs, day programs, or a combination of the two -- a feature unique in 1932 and still remarkable today.

Originally established as a College of Engineering with only a few hundred students and a handful of faculty, academic progress and growth of programs have led to a current enrollment of approximately 5,000 students and over 300 full- or part-time faculty.

In 1952 the College of Management was added, having its origins in an earlier industrial engineering curriculum. Masters programs in management were launched in 1989. The College of Architecture and Design evolved in 1962 from the former architectural engineering department, and in 1993 launched a M.Arch. program. The College of Arts and Sciences was established in 1967. Associate programs were added to Lawrence Tech’s baccalaureate offerings in 1950. Masters programs in engineering were begun in 1990 and in Arts and Sciences in 1997. Doctoral programs were inaugurated in 2002.

Concurrently, there has been an enormous expansion and improvement of facilities. The University’s first home was located in Highland Park, immediately adjacent to the huge manufacturing facility where Henry Ford perfected the moving assembly line. In 1955, the University acquired acreage and opened the first building in Southfield on what had been a General Mills research farm. The campus has since expanded to 120 acres and 10 major buildings, as well as the Frank Lloyd Wright-designed “Affleck House” in Bloomfield Hills, donated to the University in 1978.

In 1977, Lawrence Tech shed its “commuter” classification by opening its first student housing structure. The 1980s and ’90s were distinguished by the opening of the Wayne H. Buell Management Building and the Don Ridler Field House, numerous improvements to existing buildings, and a substantial increase in state-of-the-art laboratory and computer equipment.

The $20 million University Technology and Learning Center opened in 2001 and $12 million Student Housing-North opened in 2002. Planning is underway for a comprehensive Student Services Center.
The University has a selective admissions process—the objective of which is to identify men and women who have the highest potential for advancement in their chosen field of study. While the applicant’s academic record is a reliable measure for the prediction of academic success, the admissions decision is more complex than admitting students on the basis of a numerical formula. With this intent, Lawrence Tech considers, in addition to the applicant’s previous academic record, factors which demonstrate an aptitude for successful study.

For the admissions requirements for any of Lawrence Tech’s undergraduate degree programs, see the Undergraduate Catalog.

ADMISSION TO GRADUATE PROGRAMS

To initiate the application process, contact the Admissions Office (1.800.CALL.LTU) to receive the “Graduate and Professional Programs Application for Admission,” or visit the Lawrence Tech’s web site: www.ltu.edu/. In order to apply to any graduate program, students must submit the following to the Office of Admissions:

1. Completed Graduate and Professional Programs Application;
2. Application fee;
3. Official transcripts of all completed college work;
4. Any additional material as required by the college offering the degree, (i.e. GMAT/GRE scores, resume, letters of reference, portfolio, etc). These requirements are described in the program of interest, later in this Catalog.

Application material received will be carefully evaluated by the college’s Graduate Admissions Committee. To facilitate this process, the graduate applicant must provide all documentation at the time designated by each college. After the application has been reviewed by the committee, the student will be notified of the results from the Office of Admissions. The Admissions Office will be the student’s point of contact from the application stage through the orientation program, unless specified by the college for certain events.

In general, a cumulative undergraduate GPA of at least 3.00 is required for regular admission to the graduate programs. For students with less than a 3.00, the college’s Graduate Admissions Committee will carefully review the academic performance during the last two undergraduate years, letters of recommendation, and any work experience, to determine acceptability to the graduate programs. For specific admission requirements, please see the program listings, which follow in this Catalog.

Applicants who do not meet all of the conditions for regular admission may be considered for conditional admission, provided they show exceptionally high aptitude. A conditional graduate student will be granted regular admission status only after maintaining the stipulated conditions as specified by the college’s Graduate Admissions Committee.

GRADUATE ADMISSIONS TESTS

Certain programs may require one of the standardized graduate tests for admission. The GMAT and GRE exams are prepared by the Educational Testing Service and are administered regularly throughout the United States and various foreign countries.

Arrangements to take the test should be made by requesting an application from:
Graduate Management Admissions Test
Educational Testing Service
PO Box 6103
Princeton, NJ 08541

or
Graduate Record Exams
Educational Testing Service
PO Box 6000
Princeton, NJ 08541
TRANSFER STUDENTS

Policies pertaining to transfer students from other accredited graduate programs may be found later in this Catalog in the specific program of interest. Each graduate program establishes its own policies on transfer credit. Students considering transfer to Lawrence Tech from other universities must follow the same admissions requirements as described above in “Admission to Graduate Programs.” Any questions concerning credit evaluations must be resolved by the end of the first semester at Lawrence Tech.

Students may be required to submit additional evidence (e.g., course syllabi, catalog descriptions, portfolio, and tests/examinations) in order to justify transfer of credits. The college’s Graduate Admissions Committee may require the applicant to demonstrate proficiency in the subject either through an interview or written examination prepared by faculty members who have expertise in the subject/discipline. See your graduate program administrator for specific policies on transfer credit pertaining to your degree program.

GUEST STUDENTS

Graduate students may apply to Lawrence Tech as a guest student from another Michigan college or university. Guest students are allowed to enroll in specific courses for which all prerequisites have been met and for one semester only. Lawrence Tech students have enrollment preference over guest students.

Application as a guest student requires:

1. A completed “Michigan Uniform Guest Application” from the Michigan institution in which the student is enrolled which specifies the courses to be taken and includes the approval and official seal of the academic advisor and/or registrar.
2. A copy of the college transcripts showing current GPA and prerequisites for the course(s) requested.

Students not currently enrolled in collegiate programs and those who attend institutions outside of Michigan must apply as a regular graduate student, or as a non-degree special student.

NON-DEGREE SPECIAL STUDENTS

Graduate students who elect to take courses but who do not wish to pursue a degree program may enroll for one semester as a special student by submitting the following to the Admissions Office:

1. A completed application for admission (see Non-Degree Special Student section of the graduate application) and the non-refundable fee;
2. Unofficial copies of transcripts from institutions attended.

Special students must meet the normal requirements for graduate admission. Lawrence Tech students have enrollment preference over special students.

A special student who wishes to obtain regular admission to a graduate program must make a regular application to that program and meet all admissions requirements.

Credit for courses taken while a special student may be applied toward the degree if approved by the college’s Graduate Admissions Committee as part of the admissions process. When courses taken as a special student are applied toward a degree, the cumulative GPA will be computed from all graduate courses taken at Lawrence Tech.
INTERNATIONAL STUDENT ADMISSION REQUIREMENTS

International students must have above average grades in their post-secondary academic course work. International students applying for graduate programs must meet all admissions requirements. In addition, the following items must be submitted to the Admissions Office at least two months before the desired semester of enrollment:

1. completed application for admission signed by the student and non-refundable fee in U.S. currency;
2. certified true copies of original academic transcripts;
3. evidence of English proficiency;
4. an Affidavit of Support (for F-1 Visa holders);
5. an F-1 transfer clearance form (for F-1 students transferring from a U.S. college or university).

TRANSFERS WITHIN THE UNIVERSITY

Students wishing to transfer to another college within the University (example: architecture to engineering) must apply to that program and meet all regular admissions requirements. (See “Admission to Graduate Programs”.)

CHANGING MAJORS WITHIN THE COLLEGE

Currently enrolled students desiring to change majors within their college (example: MBA to MSIO) do not need to reapply for admission. Students should contact the Graduate Program Administrator of their college and complete the appropriate change of curriculum form. In some cases, administrative paperwork may be required through the Registrar’s Office. Evaluation of credits into the newly desired program will be determined by the college’s Graduate Admissions Committee.

INTERRUPTION OF STUDIES

Students who do not enroll for classes within three calendar years must reapply for admission. Readmission is not automatic; admission policies and academic programs in place at that time will apply. Students returning less than three calendar years from their previous enrollment may register in their original program without readmission. However, returning students who wish to change colleges or who have transfer credit from other institutions must reapply as a transfer student and will be subject to the curricula and requirements of the chosen program upon their return.

ADMISSIONS ADVISING AND TOURS

The Admissions Office is open year-round (except holidays). Admissions counselors are available on a walk-in basis on weekdays. Students are encouraged to call the Admissions Office if they have any questions, if they require information, or if they would like to schedule a tour of the campus at 1.800.CALL.LTU.

NON-DISCRIMINATORY POLICY

Lawrence Technological University adheres and conforms to all federal, state, and local civil rights regulations, statutes and ordinances. The University does not discriminate on the basis of race, color, sex, religion, sexual orientation, national or ethnic origin, age, disability or veteran status in any program or activity, including the administration of its education or admission policies, scholarship and loan programs, and other university-administered programs or in employment. Direct inquiries regarding non-discrimination policies to: Office of Student Affairs, 21000 W. Ten Mile Rd., Southfield, MI 48075-1058, 248.204.4100.
Lawrence Technological University sets tuition rates with the one goal of providing students with the best possible learning experience. The emphasis is on quality. Concurrently, the University has a long tradition of prudent management that has allowed it to contain costs and provide students with extraordinary value for their tuition investment, but never at the expense of Lawrence Tech’s primary emphasis.

Tuition at Lawrence Technological University is used to cover many of the costs associated with a student’s learning experience. Remaining expenses are funded through support from the University’s alumni and friends, including gifts from individuals, corporations, and foundations.

Tuition and fees are normally established on an annual basis. However, the University reserves the right to make changes in these charges or to initiate or delete charges without notice. The schedule of current tuition and fees is published separately from this Catalog and is available from the Lawrence Tech Admission, Business Services, or Registrar’s Offices.

Monthly late charges will be assessed on all accounts with past due balances. Transcripts, diplomas and/or permission to register will not be issued if an outstanding balance appears on a student’s account.

**PAYMENT OF TUITION AND FEES**

Tuition and fees are due in full at the time of registration. If full payment cannot be made at the time of registration, the following options are available to students:

1. Enroll in the University’s Installment Payment Plan;
2. Enroll in the University designated Deferred Payment Plan;
3. Provide Billing Authorization Forms (Tuition Vouchers) when the student’s employer is to be invoiced by the University;
4. Request clearance from the Financial Aid Office based on estimated eligibility. The student will be fully responsible for any charges that are not covered by Financial Aid.

The options stated above are available only when all prior balances are paid in full.

**METHOD OF PAYMENT**

Students can make payments on their accounts using any of the following methods:

1. At the Student Service Center by cash, check, money order or credit card;
2. By mailing a check, money order or appropriate credit card information;
3. By faxing appropriate credit card information. (Note: credit card information will not be accepted over the phone.);
4. On a credit card via Banner Web at my.ltu.edu.
COSTS FOR WITHDRAWAL

Costs for withdrawal are established as stipulated by federal regulations. The date when credit for withdrawal will be received can be obtained at the Registrar’s Office.

A 100 percent tuition refund will be granted for all withdrawals completed within the drop/add period. Official drop/add period dates for each semester are available on BannerWeb at my.ltu.edu. Registration fees and course fees are non-refundable and not included in the withdrawal credit calculation. Balances remaining after the drop adjustments must be paid based upon the University policy for payment of tuition and fees. Credit balances will be refunded.

The semester begins on the first day of classes as listed in the University catalog.

Date of withdrawal is the date the student’s drop form is validated by the Registrar’s Office, the postmark date of letter of withdrawal, or the date the student completes the withdrawal on BannerWeb at my.ltu.edu.

STUDENT TUITION APPEAL PROCESS

If a student wishes to receive an exception to University policy and drop classes after the 100 percent tuition refund deadline and receive a refund of any type or wishes to have the late registration fee or the late transaction fee waived, he/she should follow this process:

Submit a letter to the Registrar explaining the request and the rationale for the request. All supporting documentation should be submitted at this time (i.e. medical documentation).

The Registrar will prepare a packet of information that includes the student’s current semester’s schedule, the tuition statement for the current and previous semesters, the list of courses and grades for the student and the financial aid status for the student.

The Appeals Committee (comprised of the Registrar, Director of Admissions and Director of Business Services) reviews each student request and packet of information and makes a determination. The Committee may also contact the student’s instructor(s) to inquire as to attendance record and current grade in the course. The Registrar then sends a letter to the student with the decision.

Students should be aware that if an exception is made, the amount of their financial aid may be impacted and they may potentially owe the University money in some circumstances.

It is important to note that exceptions to University policy are made only in rare circumstances, such as a debilitating illness. Requests made because of difficult work schedules or class schedules will not be considered.
Helping graduate students with their financial planning is a function of Lawrence Tech’s Office of Financial Aid (OFA), located in the Engineering Building. Approximately two-thirds of the University’s students receive some form of financial assistance from various private, state, and federal programs. These sources provide a broad array of financial aid programs including scholarships, grants, loans, work-study, and employer sponsored tuition reimbursement.

State Tuition Grants for Michigan Residents

Lawrence Tech students in need of financial aid have the opportunity for assistance through the State of Michigan. Lawrence Tech students may receive outright grants of $100 to $2,750 toward yearly tuition depending upon need, course load, and the availability of funds. Graduate students are eligible for four semesters of Michigan Tuition Grant payments.

Requirements – To qualify for a Michigan Tuition Grant, a graduate applicant must be a U.S. citizen or an eligible non-citizen of the United States and must have been a continuous Michigan resident since July 1 (last year), and must be at least a half-time student.

How To Apply – Students should complete the Free Application for Federal Student Aid (FAFSA) by carefully reading all of the instructions. This process can be completed online at www.fafsa.ed.gov or by requesting a paper version of the FAFSA from the Office of Financial Aid. This award will be prorated down for enrollment of less than 12 credit hours. The State of Michigan will send you a letter to confirm your eligibility. If you did not list LTU as your first choice when you filled out the Free Application for Federal Student Aid (FAFSA), you will need to contact the State to notify them that you will be attending Lawrence Technological University (school code: 002279).

Deadlines – The deadline for the fall semester is March 21. This deadline may be extended depending on the availability of State funding. If you miss the deadline, it is highly recommended that you apply so the Office of Financial Aid can review your eligibility and the availability of funds.

Student Loans

Federal Subsidized Stafford Loan Program – Graduate students may borrow up to a maximum of $8,500 per year based on full-time enrollment (six credit hours). Loan eligibility is evaluated each semester and subject to change due to changes in enrollment status. Students must be enrolled at least half-time (three credit hours) in an eligible degree program at Lawrence Tech to be eligible for this loan. The Federal Government pays the interest on this loan during the grace and deferment periods (until six months after graduation, or falling below half-time status).

Federal Unsubsidized Stafford Loan Program – Graduate students may borrow up to a maximum of $18,500 per year (including Subsidized Stafford Loans) based on full-time enrollment (six credit hours). Loan eligibility is evaluated each semester and subject to change due to changes in enrollment status. Students must be enrolled at least half-time (three credit hours) in an eligible degree program at Lawrence Tech to be eligible for this loan. Need is not a factor for this loan and the student is responsible for paying interest on the loan during the grace and deferment periods. The Federal Government does not pay the interest during the grace and deferment periods.

Alternative Loans – In addition to the Stafford Loans, graduate students have access to a variety of alternative loans. The application process and terms for alternative loans...
varies by program and credit worthiness. Most students can receive funding regardless of financial need.

WORK-STUDY

**Graduate Work-Study Programs** – Graduate students meeting the eligibility criteria for work-study may be awarded funds from either the federal or state government. Students must be enrolled at least half-time (three credit hours) in an eligible degree program at Lawrence Tech to be eligible for work-study. Once notified of eligibility, students should contact Career Services for a list of potential employers. Once a work-study position is obtained, students work and receive paychecks through the University payroll system. Work-study provides the opportunity for students to receive financial aid funds through employment opportunities on and off campus. Students must meet citizenship and residency requirements for each program.

**ADDITIONAL FINANCIAL AID INFORMATION**

Application Procedures—Financial aid eligibility at Lawrence Tech is determined without regard to an applicant’s race, sex, color, religion, creed, national or ethnic origin, age, marital status, or disability. The financial aid application procedure for both new and returning students interested in state or federal programs is as follows:

A. Students are encouraged to use the office’s counseling services even if they are not receiving aid.

B. Visit the Lawrence Tech web page at [www.finan-cialaid.ltu.edu](http://www.finan-cialaid.ltu.edu) for a variety of financial aid information and a link to the Free Application for Federal Student Aid (FAFSA). Students should complete the Free Application for Federal Student Aid (FAFSA) by carefully reading all of the instructions. This process can be completed on line at [www.fafsa.ed.gov](http://www.fafsa.ed.gov) or by requesting a paper version of the FAFSA from the Office of Financial Aid.

C. Complete the FAFSA and provide all requested information and documents to the Office of Financial Aid in a timely manner. The priority deadline for applying for financial aid is May 1. All applications received after this date will be processed although considered late.

D. Processing usually takes four to eight weeks depending on the time of year and all awards are subject to the availability of funds.

E. Instructions will be provided with the award notice for accepting the financial aid offer along with additional criteria required for delivery of funds (i.e., promissory notes, enrollment status, etc.).

F. Instructions will be provided with the award notice for accepting the financial aid offer along with additional criteria required for delivery of funds (i.e., promissory notes, enrollment status, etc.).

**Basis for awards** – Awards for most programs are made on the basis of financial need. The formula used to determine need-based aid eligibility is Cost of Attendance – Expected Family Contribution (EFC) – Financial Need. EFC is an estimated amount you are able to pay toward your education based on your income, assets, etc. The types and amounts of aid students receive are determined by a combination of financial need, federal and state award maximums, and funds available. Lawrence Tech’s OFA attempts to distribute funds equitably among all eligible applicants. Students must enroll at least half-time to be eligible for Stafford Loans and Work-Study.

**Satisfactory Academic Progress (SAP)** – All students receiving financial aid are required to maintain satisfactory academic progress. Graduate students must maintain a minimum GPA of at least 2.75 to remain eligible for financial aid. Students are also required to make progress towards completing degree requirements. Students who withdraw from one-third (1/3) of the courses in which they have enrolled during the year (two semesters including summer school), do not meet SAP. Contact Lawrence Tech’s OFA for information concerning the appeal process when SAP is not met.

**Other Eligibility Criteria:**

A. Students must be U.S. citizens or eligible non-U.S. citizens as defined by the U.S. department of education to qualify for all programs. Federal regulations and University policy severely limit the types of financial assistance for international students.

B. Disbursement of financial aid funds usually takes place after enrollment verification for each semester. You must be enrolled in an eligible degree program for each fund awarded and most funds require at least half-time enrollment status. If not enrolled properly, your award is subject to change.

C. Students who have defaulted on student loans owe a refund on a grant, or owe any college tuition, will not be eligible for any financial aid until the obligation is fulfilled and monies paid back to the proper institution.

D. Lawrence Tech reserves the right to request from its students, Federal IRS 1040, 1040A, 1040EZ, or non-filing income tax information for the entire family, divorce papers for separated or divorced family members, as well as any required financial statements for verification of financial information. Students refusing to provide this information may be denied financial aid.

E. Guest students are not eligible for financial aid.

F. Students who audit classes cannot receive financial aid for the audited classes.

G. Dropping a class or classes may have an adverse effect on financial aid eligibility. Financial aid will be adjusted accordingly depending on enrollment status as described above. Future eligibility is contingent on Satisfactory Academic Progress as described above.
H. If you withdraw, or are asked to withdraw, from the University, you must immediately inform the OFA. You must also terminate any work-study employment. If you have received a Federal Stafford Loan, you should contact your lender, and arrange for an exit interview with the OFA. Your eligibility for financial aid will be determined, or recalculated, by the use of federally mandated procedures which may effect the aid already applied towards your account or previously refunded to you. Depending on when the withdrawal occurs, you may be required to repay all or part of the aid received. Students planning to withdraw from the university should contact the Office of Financial Aid to discuss any effect on your financial aid.

**FEDERAL BENEFITS FOR VETERANS**

The Veteran’s Administration provides a wide range of benefits to veterans, some reservists, and active duty personnel. Contact the V.A. on questions concerning eligibility. The amount of monthly allowance for Lawrence Tech veterans is based on the number of credit hours, the number of dependents, and the specific program qualifications.

All veterans receiving G.I. benefits are expected to maintain satisfactory academic progress. V.A. regulations permit only a two-semester probation period unless there are mitigating circumstances as determined by the V.A.

**BENEFITS FOR MICHIGAN NATIONAL GUARD PARTICIPANTS**

Members of the Michigan Air and Army National Guard (MIANG/MIARNG) may be eligible to receive a grant from Lawrence Tech up to 45 percent of base tuition and fees listed in The College Board, “College Costs and Financial Aid Book,” current edition, for full-time students. The grant will increase annually, as necessary, to remain at the 45 percent range of base tuition and fees as long as the student remains enrolled at Lawrence Tech. Grant for part-time students are prorated. MIANG and MIARNG members, including both prior and non-prior service members, will be awarded the grant based on the following eligibility criteria:

A. Member is certified to be in good standing in the MIANG or MIARNG.
B. Member is admitted to a graduate degree-granting program at Lawrence Tech.
C. Member meets LTU’s Michigan residency requirements, or is granted a waiver by the University.
D. Member maintains satisfactory academic progress as determined by Lawrence Tech.
E. Member is responsible for the cost of tuition for courses that are repeated and the Lawrence Tech grant will not apply to the number of credits for the repeated course(s).

**Procedures:**

A. Members of the MIANG/MIARNG will apply for admission to a degree-granting program at LTU.
B. Upon approval for admission, member will complete and forward the LTU/MIANG/MIARNG Grant Application to his/her MIANG or MIARNG unit representative.
C. The unit representative will verify that the member is in good standing, and forward the application to the appropriate Education Services Office, MIANG or MIARNG, at the Headquarters, Michigan National Guard, 2500 S. Washington Avenue, Lansing, MI, 48913-5101.
D. The Michigan Army or Air National Guard Education Services Officer will in turn forward the application to Lawrence Tech’s Office of Scholarships and Financial Aid.
E. Upon receipt of the completed and verified LTU/MIANG/MIARNG Grant Application, the Lawrence Tech’s Office of Scholarships and Financial Aid will credit the grant amount toward the member’s account.
The policies and procedures described in this Graduate Catalog determine the academic status of graduate students enrolled in the University. Exceptions to these policies and procedures may be considered only upon a written request to the Office of the Provost. Lawrence Tech reserves the right to update these policies and procedures as necessary. Updated policies and procedures are available online through the University’s website, www.ltu.edu/. In addition, students will be notified of the changes via their University e-mail account and/or Blackboard. For policies pertaining to undergraduate students, see the Undergraduate Catalog.

CLASSIFICATION OF STUDENTS

Classification as a part-time or full-time student is based upon the weekly academic load that the student carries. Graduate students are considered full-time when enrolled for six or more credit hours.

CREDIT HOUR

The University converted from a quarter credit system to a semester system, effective in the fall of 1994. Work completed prior to August 1994, is recorded in standard quarter hours. Work completed after August 1994, is recorded in semester hours.

GRADUATE GRADING SYSTEM

A record of grade points is kept in the student’s permanent record and used to determine his/her overall scholastic average. The following grades are computed in the grade point average:

- A 4.0 grade points per credit hour
- A- 3.7 grade points per credit hour
- B+ 3.3 grade points per credit hour
- B 3.0 grade points per credit hour
- B- 2.7 grade points per credit hour
- C+ 2.3 grade points per credit hour
- C 2.0 grade points per credit hour
- C- 1.7 grade points per credit hour
- F 0.0 grade points per credit hour (Grades of D, D+, and D-) are not awarded in graduate programs.)

The following grades are not computed in the grade point average:

- W Withdrawal
- X Audit
- Cr Credit
- NC No Credit
- I Incomplete
- NR No Report

Any disputes concerning grades must be resolved within one semester after the course was completed. Failure to receive grades by mail does not exempt students from the one semester limitation on grade changes.

RECOMPUTATION OF GRADE POINT AVERAGE

Graduate students in the College of Architecture, Arts and Sciences and Engineering are not eligible for grade point average recalculation. Graduate students in the College of Management may only repeat one course, with a failing grade, one time during the course of their degree program.

INCOMPLETE

A grade of “I” is given only under extraordinary circumstances for coursework that has been of satisfactory quality and, in the judgment of the instructor and the instructor’s dean, adequate to justify a reasonable extension of time. It is assigned only in cases in which the student has completed satisfactorily the major portion of the course requirements. Students receiving an “I” may not attend the class during a succeeding semester, unless they register for the class. Instructors must change an “I” to a grade other than “W” no later than one calendar year following the end of the semester.

GRADE CHANGES

The electronic entry of grades submitted by instructors at the end of each semester is the official record of grades. Grade changes, when necessary, are done by the instructor with approval of the department chairman and dean. The registrar may determine that the provost’s approval is also required in exceptional or unusual circumstances.
AUDITING CLASSES

Anyone wishing to audit a course must submit an audit request form along with the regular registration forms. These forms are available in the Registrar’s Office. Starting with the first day of classes, a student may not change enrollment status from audit to credit or from credit to audit. Full tuition will be charged and the tuition credit policy applies if the student withdraws.

WITHDRAWAL FROM CLASSES

When intending to drop a course or courses or withdraw from courses, it is the student’s responsibility to notify the Registrar’s Office in writing or by dropping courses online through my.ltu.edu BannerWeb. Drop/Add forms can be obtained from the Registrar’s Office. The date of the drop or withdrawal will be the date that the Registrar’s Office receives the completed Drop/Add Form from the student or the date that the student drops the course(s) on BannerWeb.

Students who are unable to drop or withdraw from courses in person or with my.ltu.edu BannerWeb may do so by mailing or faxing a written notice that contains their student ID number and signature. To protect students’ right to privacy, drops and withdrawals may not be conducted by telephone or e-mail.

Within certain time limits, tuition adjustments may be made to the students’ financial account. Be aware that there are times when students receive no tuition credit/refund for dropped courses. Official Drop/Add dates for each semester are available online on BannerWeb at my.ltu.edu. It is the student’s responsibility to know these dates and adhere to them.

It is important to note that exceptions to University policy are made only in rare circumstances, such as a debilitating illness. Requests made because of difficult work schedules or class schedules will not be considered.

GRADES FOR COURSES DROPPED

Students who drop a course during the first two (2) weeks of classes during the Fall or Spring semester will receive a “Drop” on their Registration Form and no grade will appear on their transcript.

Students who withdraw from a course before the 13th week of the Fall or Spring semester but after the first two weeks of classes will receive the “W” grade.

The last day to withdraw from Summer semesters and short courses within the regular Fall and Spring semester is adjusted for the shorter time period as follows:

<table>
<thead>
<tr>
<th>Semester Length</th>
<th>Must withdraw before</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 weeks</td>
<td>4th week</td>
</tr>
<tr>
<td>6 weeks</td>
<td>5th week</td>
</tr>
<tr>
<td>7.5 weeks</td>
<td>6th week</td>
</tr>
<tr>
<td>10 weeks</td>
<td>8th week</td>
</tr>
</tbody>
</table>

After the last day to withdraw for any semester, students will not be permitted to withdraw from the course and will receive grade as determined by the instructor (not a “W”).

All withdrawals or drops must be initiated by student action to assure that a “W” will appear on the master grade roster and subsequent transcripts. Faculty may not initiate withdrawal procedures nor may they submit a “W” on the electronic grade entry.

Drop and Withdrawal forms for each semester may be obtained in the Registrar’s Office.

CHANGE OF CLASS SCHEDULE

Beginning the first day of classes, students may change their schedule by use of the Drop/Add Form or online via my.ltu.edu BannerWeb.

The student is responsible for submitting Drop/Add Forms directly to the Registrar’s Office and retaining the validated student copy. Classes must be added during the first two weeks of classes.

All changes to the student’s schedule are effective on the date conducted via Banner Web or the date the Registrar’s Office receives the form.

ATTENDANCE

Class attendance records of students are kept by all members of the faculty. The consequences of absenteeism will be determined by the instructor and will reflect his/her policy and judgment with respect to the effect of attendance on the student’s final grade.

PREREQUISITES

Students are responsible for successfully completing prerequisites listed in this Catalog or in the my.ltu.edu Online Catalog for all courses in which they are registered. In those exceptional circumstances where a prerequisite may be waived, the student must complete the Prerequisite Waiver Form and submit it to the department head or dean of the college offering the course. If a Prerequisite is waived, it is for one semester only and does not exempt the student from taking the waived prerequisite in the future.

Beginning the first day of classes, students may change their schedule using an Drop/Add form or online through my.ltu.edu BannerWeb.
SCHEDULE OF CLASSES

Programs for regular students are outlined in this Graduate Catalog. Class schedules giving the particular days and the hours of the various classes are made available during registration for each semester online at www.ltu.edu and my.ltu.edu BannerWeb.

GRADE REPORTS

Grades are available at the end of each semester online through my.ltu.edu BannerWeb. Report cards are mailed only upon student request to the Registrar’s Office.

STUDENT COMMUNICATIONS/STUDENT E-MAIL

All students are required to obtain and maintain University computer accounts while they are enrolled at Lawrence Tech. These accounts are provided free to registered students. Students may access these accounts while on campus with laptops or PC’s. They may also be accessed off-campus online.

Students may also communicate directly with faculty, staff and administrators through e-mail.

E-mail is considered a formal channel of communication and official University correspondence is sent to students via e-mail. Students are expected to review their e-mail on a regular basis.

ONLINE STUDENT SERVICES

Lawrence Tech offers a variety of convenient online student services. Students can register for courses, view their academic records, make tuition payments and conduct financial aid transactions through my.ltu.edu BannerWeb from any location at any time.

Students may register online using their nine-digit Student ID number and their PIN. In addition, students in the colleges of Arts and Sciences and Engineering need to obtain an Alternate PIN from their academic advisor. The Alternate PIN is the advisor’s electronic signature, giving the student approval to register. Students must not owe a balance from previous semesters to register.

Students may also view and print an unofficial copy of their student transcript, provided they do not have a hold that prohibits this function (such as owing the University money).

PROBATION AND DISMISSAL POLICIES FOR GRADUATE STUDENTS

Academic Probation –
Graduate students whose cumulative grade point average falls below 3.00 in any semester will be placed on academic probation in the following semester.

Dismissal – Students who remain on probation for two successive semesters, or any student on academic probation who fails to meet the requirements of that probation, will be suspended from the University for a minimum of one calendar year.

Students who have been suspended and subsequently readmitted but who fail to meet the conditions of their readmission will be dismissed from the University. The University will not accept transfer credit for courses taken at another college or university during a period of one calendar year following suspension.

EXCESSIVE REPEATING AND WITHDRAWAL

Students are expected to successfully complete all the courses in which they are registered and are encouraged to plan their schedules to avoid overloads and conflicts, which would interfere with that objective. Any student who engages in excessive withdrawal from classes will be subject to academic review and may be placed on academic probation regardless of the overall grade point average. Subsequent continuation of this behavior may result in suspension or dismissal. Circumstances demonstrably beyond the student’s control will excuse him/her from this requirement, but poor scholarship will not. Specific academic guidelines to an individual professional degree, post-professional degree or graduate program must be followed in addition to any general University guidelines in this respect.

ACADEMIC STANDING COMMITTEE/READMISSION

Graduate students who have been dismissed from the University because of poor scholarship may, after one calendar year, submit a written petition for readmission to the chair of the Academic Standing Committee, or administrator of the program in the respective College. This petition should be received at least one month before the first day of class of the semester in which the student wishes to return.

Evidence of planning, curriculum load, and work activities are taken into considera-
Students applying to the M.Arch. professional degree in the College of Architecture and Design must submit a portfolio of work completed in previous design courses including any work they may have done in a professional capacity while away from the academic setting. The work submitted must be in accordance with admission guidelines.

The petition may include a letter from an employer attesting to competent work and maturity. An official transcript of courses taken at another institution must be submitted at the time the student applies for readmission. However, credit will not be allowed for any work taken at another institution for the period of one calendar year following dismissal. Once admitted, a student is required to abide by the catalog graduation requirements at the time of readmission. A student’s requirements for graduation may be subject to reevaluation.

Students wishing to reapply to a graduate professional or post-professional degree program after having been dismissed must also make a regular application for admission.

ENROLLMENT AT OTHER INSTITUTIONS

Students enrolled at Lawrence Tech may not take courses at other colleges and universities after admission to Lawrence Tech and expect those credits to transfer without the prior written permission of the Credit Review Committee.

Students should complete the Guest Credit Approval Form and submit this form to the Registrar’s Office at least one month in advance. The Credit Review Committee meets every two (2) weeks and reviews each request individually. Following review, the Registrar will then inform the student of the Committee’s decision by letter.

Courses taken in violation of this policy will be denied transfer credit. For those courses approved, the student must receive at least a 2.0 in the course to have it transfer back to Lawrence Tech. It is the student’s responsibility to have the official transcript sent to the Registrar’s Office at Lawrence Tech. Until the official transcript arrives, the credit will not be placed on the student’s record.

Courses taken at Lawrence Tech may not be transferred back to the student’s transcript. If the time constraints of a particular program have been, or will be exceeded through readmission, the student must also reapply to the specific program for an extension of the program’s time limit.

Once admitted, a student is required to abide by the Academic Regulations of the College of Architecture and Design. When such work is kept, arrangements will be made for the student to receive suitable photographic copies as a record of his design work. Whenever any student work is exhibited or published, the student will receive proper acknowledgement of his or her efforts.

Transfer credit is generally not given for courses taken at other institutions after enrollment at Lawrence Tech, unless those courses cannot be completed at the University.

RECORDS (Transcripts)

A permanent record of all credits earned at or transferred to the University is maintained for each student in the Office of the Registrar. These records are preserved indefinitely. All graduates are mailed a free copy of their academic record at Lawrence Tech as soon as possible after the degree is reflected on the record, providing financial obligations to Lawrence Tech have been settled by that date.

At all other times, a nominal charge is made for all official copies of a student’s record at Lawrence Tech. Copies of records (transcripts) will not be released without the student’s authorization in writing. Transcripts will not be issued unless all financial obligations from prior terms have been settled.

ARCHITECTURAL DRAWINGS AND REPORTS

Architectural students are advised that all thesis reports, two and three dimensional drawings and models, as well as reports and other written studies submitted in satisfaction of any required or elective architectural courses become the property of the University, and may be kept or returned at the sole discretion of the dean of the College of Architecture and Design. When such work is kept, arrangements will be made for the student to receive suitable photographic copies as a record of his design work. Whenever any student work is exhibited or published, the student will receive proper acknowledgement of his or her efforts.

INSPECTION OF RECORDS

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT OF 1974

Lawrence Technological University intends to comply fully with the Family Educational Rights and Privacy Act of 1974. This Act was designed to protect the privacy of education records, to establish the right of students to inspect and review their educational records, and to provide guidelines for the correction of inaccurate or misleading data through informal or formal hearings. Students also have the right to file complaints with the Family Educational Rights and Privacy Act Office concerning alleged failures by the University to comply with the Act.

University policy explains in detail the procedures used for compliance with the provisions of the Act. Copies of the policy are kept on file in the Registrar’s Office. Requests for information relating to the foregoing should be addressed to the Office of the Registrar at Lawrence Technological University.
DEGREES

Lawrence Technological University offers curricula leading to the following professional or post-professional graduate degrees. (For information on undergraduate degrees, see the Undergraduate Catalog or www.ltu.edu).

College of Architecture and Design:
- Master of Architecture (professional degree)
- Master of Architecture (post-professional degree)
- Master of Interior Design

College of Arts and Sciences:
- Master of Science Education
- Master of Science in Computer Science
- Master of Science in Technical Communication

College of Engineering:
- Certificate of Manufacturing Systems
- Master of Civil Engineering
- Master of Construction Engineering Management
- Master of Engineering in Manufacturing Systems
- Master of Engineering Management
- Master of Science in Automotive Engineering
- Master of Science in Civil Engineering
- Master of Science in Electrical and Computer Engineering
- Master of Science in Mechanical Engineering
- Doctor of Engineering in Manufacturing Systems

College of Management:
- Master of Business Administration
- Master of Business Administration (weekend)
- Master of Science in Industrial Operations
- Master of Science in Industrial Operations (weekend)
- Master of Science in Information Systems
- Doctor of Business Administration
- Doctor of Management in Information Technology
Petitions for graduation for each semester have specific due dates. Students must contact the Registrar’s Office for these dates. It is the student’s responsibility to be aware of these dates and adhere to them.

Processing of petitions after that date, if approved by the Registrar’s Office, requires that a substantial processing fee be assessed to the student. Further, availability of caps, gowns and diplomas in time for commencement cannot be guaranteed.

A “Petition for Graduation” must be submitted one calendar month preceding the date of expected graduation. Students planning to participate in the commencement ceremony must notify the Registrar’s Office by March 1.

A graduation fee is charged and is refundable in the event the student does not complete requirements as planned. A new petition must be submitted in the event requirements for graduation are not completed before the end of the Summer Semester immediately following the academic year.

The Master of Architecture professional degree and Master of Architecture post-professional degrees are awarded to graduates who maintain a minimum cumulative 3.00 grade point average (GPA) in all degree program classes. Students in the College of Management who maintain at least a 3.75 cumulative GPA in graduate courses will receive the diploma honor “with distinction.”

Master’s degrees offered through the Colleges of Arts & Sciences, Management, and Engineering are awarded upon completion of all required course work within seven years of matriculation and maintenance of a minimum 3.00 cumulative GPA. Students in the College of Management who maintain at least a 3.75 cumulative GPA in graduate courses will receive the diploma honor “with distinction.”

The University reserves the right to modify its graduation and other academic requirements as may be deemed necessary. It will be obligated only during the academic year of the student’s registration by requirements published in the Graduate Catalog for that year.
COURSE NUMBER AND LEVEL

On the pages of course descriptions that follow, each course is identified by an alphanumeric course number. The alphabetic prefix represents the subject area.

College of Architecture and Design
- Architecture ARC
- Illustration and Graphic Design ART
- Interior Architecture/Design ARI

College of Arts and Sciences
- Biology BIO
- Botany BOT
- Chemistry CHM
- Communications COM
- Geology GLG
- Language and Literature LLT
- Mathematics and Comp Sci MCS
- Physical Science PSC
- Physics PHY
- Psychology PSY
- Science Education SCE
- Social Science SSC

College of Engineering
- Civil Engineering ECE
- Electrical Engineering EEE
- Mechanical Engineering EME
- General Engineering EGE

College of Management
- Accounting ACC
- Finance FIN
- Human Resources Mgt HRM
- Industrial Operations MIO
- Management MGT
- Management Info Systems MIS
- Marketing MKT
- Operations Management OPM

The first number following the alpha prefix indicates the academic level of the course: 0 = Basic Studies; 1 = Freshman; 2 = Sophomore; 3 = Junior; 4 = Senior; 5, 6, and 7 = Professional, Post-Professional and Graduate level; 8 = Doctoral. Basic study courses (course level zero) normally do not provide degree credit.

The last of the four numbers normally indicates the semester hours of credit assigned to the course. For example, ARC3653 carries three hours of credit.

CATALOG OF ENTRY – LIMITATIONS

Although graduation requirements of the University may change while a student is enrolled, students are normally expected to meet the graduation requirements outlined in the Catalog that is in effect at the time they matriculate, as long as the courses are still offered by the University. Substitutions may be made for required courses that may no longer be available. However, if the new graduation requirements may be adapted to a student’s current course of study without increasing his or her credit hour requirements or existing prerequisites, the new requirements shall prevail. Students interrupting their studies for three calendar years or more must reapply for admission (see Admission section, Interruption of Studies). If readmitted, the Catalog in effect at the time of readmission is used to determine graduation requirements. In addition, within the College of Architecture and Design, the requirements outlined in the Program Notes for the M.Arch. professional degree and the M.Arch. post-professional degree for the year of entry into the respective program also apply.
DEGREE PROGRAMS OFFERED

Lawrence Tech’s College of Architecture and Design offers these graduate programs:

- Master of Architecture Professional Degree
- Master of Architecture Post-Professional Degree
- Master of Interior Design

The College of Architecture and Design at Lawrence Technological University is among the 30 oldest schools of architecture in the United States. Its mission is to provide a comprehensive architectural education which synthesizes diverse approaches, disciplines and human resources. The intent is to develop graduates committed to creative inquiry, critical judgement, progressive architectural design, communication and professional leadership.

Lawrence Tech’s architecture program emphasizes design integration and experimentation through innovative curricula that emphasize the interrelationship of technical, social, environmental, and philosophical ideas. Architecture cannot be created in isolation. Its success depends on supportive harmony with all creative disciplines. Lawrence Tech believes in the architect, educated as a generalist and focused on the creative process, prepared to cope with the complex demands dictated by contemporary society.

Community Design is offered in the Detroit Studio where students network with representatives from government, the design professions, and the business community. The Detroit Studio offers an...
enriched educational experience through an urban laboratory for design and research projects. M.Arch students may fulfill requirements for an Area of Concentration in Collaborative Urban Design.

The curricula of the College of Architecture and Design are structured in four undergraduate programs, two professional degree program, and one post-professional degree program in architecture. Students are cautioned that course selection approval at the time of registration is based on stated prerequisite requirements and the student’s ability to maintain adequate academic progress in collateral courses as indicated in the respective curriculum outlines.

A master plan of studies may be formulated by the student, in consultation with an advisor, based on the Program Notes provided to each incoming professional and post-professional student, and are available in the College’s administrative office.

For firsthand experience, great emphasis is placed on field trips which may be a part of any course offered by the College.

Transfer students are encouraged to enter any of the degree programs in which they have the interest and qualifications. When a complete or accurate description of previous course work is lacking, a transfer student may be asked to present a portfolio of work, complete specific studio problems, or enroll in certain courses to ensure correct placement within the program. Lawrence Tech’s College of Architecture and Design is a member of the Association of Collegiate Schools of Architecture and the National Institute for Architectural Education. The Bachelor of Interior Architecture program is accredited by the Foundation for Interior Design Education Research (FIDER) and the B.F.A. in architectural illustration by the National Association of Schools of Art and Design (NASAD). The Bachelor of Facility Management is accredited by the International Facility Management Association (IFMA).

NAAB ACCREDITATION

The M.Arch. degree is accredited by the National Architectural Accrediting Board (NAAB).

As stated by the National Architectural Accrediting Board (NAAB), 1998 Conditions and Procedures: “Most states require that an individual intending to become an architect hold an accredited degree. There are two types of degrees that are accredited by the National Architectural Accrediting Board: (1) the Bachelor of Architecture and (2) the Master of Architecture. These professional degrees are structured to educate those who aspire to registration/licensure as architects.”

NAAB further states: “The four-year preprofessional degree, where offered, is not accredited by NAAB. The preprofessional degree is useful for those wishing a foundation in the field of architecture, as preparation for either continued education in a professional degree program or for employment options in architecturally related fields.”

Lawrence Tech’s M.Arch Professional degree requires the applicant to already hold an undergraduate degree in architecture from a recognized college or university school of architecture. The Post-Professional M.Arch degree is based on the student already possessing a professional degree in one of the design or related disciplines.

PROGRAM DECLARATION

Students must declare which program they will pursue at the time the graduate application is submitted. The Program Notes and Catalog in effect at the time of acceptance into the particular program are the governing determinants of the degree requirements that apply.

MASTER OF ARCHITECTURE PROFESSIONAL DEGREE (36 CR. HRS.)

For students desiring a career of leadership in society and practice, the University offers the M.Arch professional degree program. It offers the academic credentials for professional licensing and admission to the field of architecture. This program of academic course work combines graduate studies in architectural design and theory, including master classes, and selective research with professional practice, advanced liberal education courses and interdisciplinary studies. A wide range of architecture elective courses is offered. Outstanding faculty, including visiting professors in master class studios, offer a rich variety of courses. The Thesis and Master Class are the focus of the program.

Enrollment in the Master Class must follow the Thesis sequence.

The M.Arch. student has the opportunity to specialize in an area of professional interest by selecting an area of concentration. Additional courses are not required when pursuing a concentration. Students may select 13 of the 36 total required credit hours to focus on one of the following areas of concentration:

• International Studies
• Management and Practice
• Community-based Urban Design
• Preservation and Existing Structures
• Interior Architecture

The M.Arch. professional degree program is open to highly qualified graduates of college/university architectural programs who meet all admission requirements. Students who work while earning the M.Arch. degree should plan to distribute course work over two to four years.

The requirements for the Master of Architecture degree are supplemented annually by “Program Notes” provided to each accepted graduate student.
ADMISSIONS REQUIREMENTS
M.Arch. Professional Degree

Students are eligible to apply for this program if they are graduates of a recognized baccalaureate degree program in architecture. Admission to the M.Arch professional degree program as a regular student requires:

1. Submission of the “Graduate and Professional Programs Application for Admission”;
2. Official transcripts of all completed college work;
3. Minimum undergraduate GPA of 3.00;
4. A resume, including experience and extracurricular activities;
5. Three letters of recommendation including one from a practicing architect and one from a faculty member employed by a college or university school of architecture who is familiar with the candidate’s professional promise (for additional information refer to the “Program Notes”);
6. A portfolio for review by the Graduate Admissions Committee of the College of Architecture and Design to further demonstrate potential for success.

TRANSFER STUDENT PROCEUDRE, M.Arch Professional Degree

Students who are currently enrolled in an accredited graduate program in architecture may be accepted into the M.Arch professional degree program on the basis that they meet all admissions requirements. Credit for courses taken in an accredited graduate program will be reviewed for their acceptability as substitutes for required courses in the Lawrence Tech M.Arch professional degree program. A request that such courses be considered must be made at the time of the student application.

Courses taken to meet undergraduate degree requirements may not be used for graduate credit. Normally, a maximum of 6 credits for non-core, non-design courses will be allowed for transfer credit. A minimum GPA of 3.00 or better must have been achieved. The courses must have been completed within five years of the application for admission. Exceptions to these guidelines require the approval of the administrator of the graduate programs.

APPLICATION PROCEDURES – M.Arch Professional Degree

The deadline for REGULAR admission to the M.Arch professional degree program is February 1. of each year. Applications for other admissions categories are accepted by the University Admissions Office throughout the year. Formal acceptance into the program normally occurs during early March or July. The Thesis sequence commences in the summer prior to the fall semester start of classes. Those interested in starting their Thesis sequence in the first summer should apply February 1.

The deadline for EARLY admission to the M. Arch. professional degree program is November 1. Applicants accepted as part of the November 1 deadline may start in the graduate program in January but only with graduate elective courses.

The following guidelines have been established by the Graduate Admissions Committee of the College of Architecture and Design to facilitate and expedite the admissions process:

Regular Admission – All candidates to the M.Arch. professional degree program require the approval of the Graduate Admissions Committee. REGULAR admission is available only to students who meet all College of Architecture and Design program requirements.

Conditional Admission – There are three categories of CONDITIONAL admission:
1. Conditional admission may be granted to qualified Lawrence Tech undergraduate B.S. Arch students who have applied to the M.Arch professional degree program, who have a 3.00 GPA or higher, and who will complete all undergraduate degree requirements no later than the summer semester prior to the academic year in which they would enter the graduate program. Students wishing to enroll in graduate electives during their senior year must consult with the administrator of the graduate programs no later than four weeks prior to the scheduled normal registration period. All graduate courses taken under conditional admission must be electives and require approval of the administrator of the graduate programs. Courses are limited to no more than six credits. Professional degree or graduate elective courses taken to meet undergraduate degree requirements may not be used to meet professional degree or graduate program requirements.

2. Conditional admission may also be granted to students with less than a 3.00 GPA, but higher than a 2.75, or applicants whose portfolio and references are not of the highest standard. The conditions of the admission will be clearly stated to the applicant at the time of notification of conditional acceptance into the program. Conditional admission requires the approval of the College of Architecture and Design Graduate Admissions Committee, and is established as a result of the formal review process.

Provisional Graduate Standing – An applicant may enroll as a provisional student whether or not there is the intent to apply or reapply to the graduate degree program.
This status does not require formal acceptance from the Graduate Admissions Committee. It does require permission from the graduate administrator or dean of the college. A limit of six credit hours over one academic year of elective graduate courses may be taken. Enrollment in classes does not guarantee admittance to the graduate degree programs. A request may be made to the administrator of the program and the dean for course transfer once the student is accepted to the graduate degree program by the Graduate Admissions Committee.

MASTER OF ARCHITECTURE POST-PROFESSIONAL DEGREE

The Master of Architecture (M.Arch) post-professional degree program offers many advantages to graduates from professional degree programs in architecture, design, and other professional careers of leadership in society and practice. It is offered in addition to the M.Arch professional degree program in architecture offered by Lawrence Technological University. The post-professional M.Arch. degree is beyond the need for NAAB or other accreditation in that it is not associated with requirements for licensure in any design profession.

The objective of this program is to focus on the Reflective Practice Studio and combine graduate studies in architecture with advanced liberal education courses and interdisciplinary leadership courses so that graduates will obtain a breadth of understanding and accept leadership roles in society and practice.

The Reflective Practice Studio, an elective offering to Master of Architecture professional degree students, is required for the post-professional degree program. The post-professional degree program is designed for professionals in architectural or other design practices. Graduates may have enriched opportunities to work in areas of teaching, management as well as government.

Required courses include advanced liberal education courses specifically designed for mature students. In addition to master classes, course offerings available to M.Arch. professional degree students are also available to M.Arch. post-professional students. Professors for the Reflective Practice Studio are recognized leaders in the field of architecture, landscape architecture or urban design.

The post-professional degree program and its related curriculum is an intensive, minimum of one year of graduate studies. Course work is planned to be completed in one year, but may be taken over a maximum of three years.

The post-professional degree program may begin in any semester.

The requirements for the Master of Architecture post-professional degree are supplemented annually by “Program Notes” provided to each accepted graduate student.

ADMISSIONS REQUIREMENTS – M.Arch POST-PROFESSIONAL DEGREE

Students are eligible to apply to this program if they already possess a professional degree from a recognized professional degree program or have similar qualifications from another design or related profession. Admission to the post-professional degree program requires:

1. Submission of the "Graduate and Professional Programs Application for Admission";
2. Official transcripts of all completed college work;
3. Minimum professional degree GPA of 3.00, or acceptable performance on the Graduate Record Examination;
4. A resume, including work experience, professional achievement and any professional licenses held;
5. Three letters of recommendation including one from a practicing architect and one from a faculty member employed by a college or university school of architecture who is familiar with the candidate’s professional promise;
6. A portfolio is not required, but may be submitted as further evidence of the applicant’s ability to complete the program at a high standard.

TRANSFER STUDENT PROCEDURE – M.Arch POST-PROFESSIONAL DEGREE

Credit for courses taken in a graduate level program will be reviewed for their acceptability as elective courses in the Lawrence Tech post-professional degree program. A request for courses to be considered must be made at the time of application. Courses taken to meet undergraduate or professional degree requirements may not be used for post-professional graduate credit. A minimum grade of 3.00 must have been achieved. Courses must have been completed within five years of the application for admission. Exceptions to these guidelines require the approval of the administrator of the graduate programs.

In exceptional circumstances, and with the approval of the administrator and the dean, additional credits may be allowed as substitutes for electives to applicants who possess outstanding practice credentials. Normally, a maximum of six additional credits would be allowed.

APPLICATION PROCEDURES – M.Arch POST-PROFESSIONAL DEGREE

Application to the M.Arch post-professional degree program may be made at any time.

Admission to the graduate post-professional degree program is granted as follows: Regular Admission --

Applicants will have earned a cumulative GPA of 3.00 on past professional degree work,
and/or satisfactory passing of the Graduate Record Examination.

Conditional Admission—Students granted this classification have completed the application process to the graduate post-professional degree program, but have not yet received formal acceptance or denial. This classification is granted on a semester to semester basis, and allows the student to register for post-professional degree classes in anticipation of REGULAR admission. However, enrollment in classes does not guarantee admittance to the program.

**MASTER OF ARCHITECTURE PROFESSIONAL 4+3 DEGREE**

The professional Master of Architecture 4+3 is for students who do not hold a baccalaureate degree in architectural studies from a NAAB accredited program, but who do have a baccalaureate or advanced degree from any other university or college.

The requirements for the M. Arch 4+3 professional degree are supplemented annually by “Program Notes,” provided to each accepted student.

Students interested in the M. Arch 4+3 professional degree program should contact the administrator of the graduate program.

**MASTER OF ARCHITECTURE – PROFESSIONAL DEGREE**

**TOTAL SEMESTER CREDIT HOURS: 36**

(In addition to an acceptable undergraduate degree in architecture)

**SUMMER SEMESTER**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Subject</th>
<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>ARC5010</td>
<td>Pre Thesis (m)</td>
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<tr>
<td>ARC5XXX</td>
<td>Arch Elective</td>
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<td>ARC5012</td>
<td>Research Methods (m)</td>
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**FALL SEMESTER**

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<td>Envr Issues (m)</td>
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<td>ARC5514</td>
<td>Thesis 1 (m)</td>
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<td>ARC5913</td>
<td>Prof Pract 1 (m)</td>
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<tr>
<td>ARC5XXX</td>
<td>Arch Elective</td>
<td>2</td>
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<tr>
<td></td>
<td>or Research Methods</td>
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**SPRING SEMESTER**

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<td>Thesis 2 (m)</td>
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<td>ARC5632</td>
<td>Arch Theory (m)</td>
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<td>ARC5922</td>
<td>Prof Pract 2 (m)</td>
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<td>ARC5XXX</td>
<td>Arch Electives</td>
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**SUMMER SEMESTER**

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<td>LLT8012</td>
<td>Lit of Built Environ (m)</td>
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<td>MGT6013</td>
<td>Leadership/Mgt (m)</td>
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<td>SSC8012</td>
<td>Soc Resp/Comm Action (m)</td>
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</table>

**NOTES:**

(#{}) Enrollment in the Master Class must follow the thesis sequence.

(m) Core courses, available only to fully matriculated M.Arch. students.

**MASTER OF ARCHITECTURE-PROFESSIONAL DEGREE PROGRAM ADVISOR:** David Ghasco, ext. 2805, Username: CHASCO@LTU.EDU, Room A129

**MASTER OF ARCHITECTURE AREAS OF CONCENTRATION**

**TOTAL SEMESTER CREDIT HOURS: 13**

(13 of the total 36 required credit hours within the Master of Architecture are focused on an interest of Concentration)
<table>
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<tr>
<td>ARC5524</td>
<td>Thesis 2</td>
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</tr>
<tr>
<td>ARC5542</td>
<td>Project Mgt</td>
<td>2</td>
</tr>
<tr>
<td>ARC5832*</td>
<td>Res. in Coll. Urb Des</td>
<td>2</td>
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<tr>
<td>ARC5853</td>
<td>Coll. Urban Design</td>
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<td>ARC6842*</td>
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**INTERNATIONAL STUDIES**

**Fall Semester**

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**Spring Semester**

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<tr>
<td>ARC5832*</td>
<td>Res. in Int. Studies I</td>
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**MANAGEMENT AND PRACTICE**

**Fall Semester**

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**Spring Semester**

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**COLLABORATIVE URBAN DESIGN**

**Fall Semester**

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<tr>
<td>ARC6842*</td>
<td>Res.in Coll. Urb Des</td>
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**Spring Semester**

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<tr>
<td>ARC5524</td>
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<td>ARC5853</td>
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**PRESERVATION AND EXISTING STRUCTURES**

**Fall Semester**

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<tr>
<td>ARC5832*</td>
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**Spring Semester**

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<td>ARC6853*</td>
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**INTERIOR ARCHITECTURE**

**Fall Semester**

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**Spring Semester**

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<tr>
<td>AR5873</td>
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</table>

**NOTES:**

* Research classes pertaining to each Area of Concentration may be taken in either the Fall, Spring or Summer E Semesters.

**MASTER OF ARCHITECTURE AREAS OF CONCENTRATION ADVISOR:**

David Chasco, ext. 2805, Username: CHASCO@LTU.EDU, room A129

**MASTER OF ARCHITECTURE POST-PROFESSIONAL DEGREE PROGRAM ADVISOR:**

David Chasco, ext. 2805, Username: CHASCO@LTU.EDU, room A129

**SECRETARY TO THE GRADUATE ADMINISTRATOR:**

Alice McHard, ext. 2834, Username: McHard@LTU.EDU, room A116

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**MASTER OF ARCHITECTURE POST-PROFESSIONAL DEGREE**

**TOTAL SEMESTER CREDIT HOURS: 30**

(In addition to an acceptable, accredited professional degree)

**Summer Semester**

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**Fall Semester**

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<td>ARCXXXX Arch Elective</td>
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**Spring Semester**

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<tr>
<td>ARCXXXX Arch Elective</td>
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</tr>
</tbody>
</table>

**NOTES:**

See your academic advisor for elective requirements, and further specific information on your degree program.

**MASTER OF ARCHITECTURE POST-PROFESSIONAL DEGREE PROGRAM ADVISOR:**

David Chasco, ext. 2805, Username: CHASCO@LTU.EDU, room A129

**SECRETARY TO THE GRADUATE ADMINISTRATOR:**

Alice McHard, ext. 2834, Username: McHard@LTU.EDU, room A116
(37 CREDIT HOURS)

The Master of Interior Design combines theory, professional issues and current technology to provide a program aimed at people who are interested in expanding or updating their knowledge of the field. The program has two tracks. The 37-credit hour curriculum is for people with undergraduate degrees in interior design or interior architecture. A 4 + 3 track is available to people who hold at least a bachelor’s degree in another discipline and who would like to change careers. This 79-credit hour curriculum combines the content of the undergraduate professional courses with the graduate courses to also result in a Master of Interior Design. The program has a core in research, theory, issues, and design application and allows for independent exploration of topics. The final course in the program is the Master Class or Reflective Practice Studio.


Students are eligible to apply for this program if they are graduates of a recognized baccalaureate degree program in interiors. Admission to the M.I.D. degree program as a regular student requires:

1. Submission of the “Graduate and Professional Programs Application for Admission”;
2. Official transcripts of all completed college work;
3. Minimum undergraduate GPA of 2.70;
4. A resume, including experience and extracurricular activities;
5. Three letters of recommendation including one from a practicing interior designer and one from a faculty member employed by a college or university who is familiar with the candidate’s professional promise.
6. A portfolio for review by the Graduate Admissions Committee of the College of Architecture and Design to further demonstrate potential for success.


Students who are currently enrolled in a graduate program in interior design may be accepted into the M.I.D. program on the basis that they meet all admissions requirements. Credit for courses taken in a graduate program will be reviewed for their acceptability as substitutes for required courses in the Lawrence Tech M.I.D. program. A request that such courses be considered must be made at the time of the student application.

Courses taken to meet undergraduate degree requirements may not be used for graduate credit. Normally, a maximum of 6 credits for non-core, non-design courses will be allowed for transfer credit. A minimum GPA of 3.00 or better must have been achieved. The courses must have been completed within five years of the application for admission. Exceptions to these guidelines require the approval of the administrator of the graduate programs.


The deadline for REGULAR admission to the M.I.D. program is February 1. of each year. Applications for other admissions categories are accepted by the University Admissions Office throughout the year. Formal acceptance into the program normally occurs during March.

The following guidelines have been established by the Graduate Admissions Committee of the College of Architecture and Design to facilitate and expedite the admissions process:

Regular Admission – All candidates to the M.I.D. program require the approval of the Graduate Admissions Committee. REGULAR admission is available only to students who meet all College of Architecture and Design program requirements.

Conditional Admission – There are three categories of CONDITIONAL admission:

1. Conditional admission may be granted to qualified Lawrence Tech undergraduate Interior Arch students who have applied to the M.I.D. program and who will complete all undergraduate degree requirements no later than the summer semester prior to the academic year in which they would enter the graduate program. Students wishing to enroll in graduate electives during their senior year must consult with the administrator of the graduate programs no later than four weeks prior to the scheduled normal registration period. All graduate courses taken under conditional admission must be electives and require approval of the administrator of the graduate programs. Courses are limited to no more than six credits. Professional degree or graduate elective courses taken to meet undergraduate degree requirements may not be used to meet professional degree or graduate program requirements.

2. Conditional admission may also be granted to students with less than a 2.70 GPA, but higher than a 2.50, or applicants whose portfolio and references are not of the highest standard. The conditions of the admission will be clearly stated to the applicant at the time of notification of conditional acceptance into the program. Conditional admission requires the approval of the Graduate Admission Committee.

Provisional Graduate Standing – An applicant may enroll as a provisional student whether or not there is the intent to apply or reapply to the graduate degree program. This status does not require formal acceptance from the
Graduate Admissions Committee. It does require permission from the graduate administrator or dean of the college. A limit of 6 credit hours over one academic year of elective graduate courses may be taken. Enrollment in classes does not guarantee admittance to the graduate degree programs. A request may be made to the administrator of the program and the dean for course transfer once the student is accepted to the graduate degree program by the Graduate Admissions Committee.

MASTER OF INTERIOR DESIGN DEGREE
TOTAL CREDIT HOURS: 37
(In addition to an acceptable undergraduate degree in Interior Design or Interior Architecture)

<table>
<thead>
<tr>
<th>Course No.</th>
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<th>Cr. Hrs.</th>
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<tbody>
<tr>
<td>ARC 5012</td>
<td>Research Methods</td>
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<tr>
<td>ARI 5113</td>
<td>Interior Architecture Graduate Studio</td>
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<tr>
<td>ARI 5612</td>
<td>Interior Design Theory</td>
<td>2</td>
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<tr>
<td>ARI 5622</td>
<td>Current Issues in Interior Design</td>
<td>2</td>
</tr>
<tr>
<td>ARI 5873</td>
<td>Advanced Interior Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ARI 5143</td>
<td>Lighting Design and Research</td>
<td>3</td>
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<tr>
<td>ARI 5223</td>
<td>Architectural Graphics</td>
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<td>ARC 6903</td>
<td>Educational Praxis</td>
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<tr>
<td>ARC 6872</td>
<td>Research in Interior Architecture</td>
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<tr>
<td>ARC 7006</td>
<td>Reflective Practice Studio</td>
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ARC 5012 Research Methods 2
ARI 5113 Interior Architecture Graduate Studio 3
ARI 5612 Interior Design Theory 2
ARI 5622 Current Issues in Interior Design 2
ARI 5873 Advanced Interior Architecture 3
ARI 5143 Lighting Design and Research 3
ARI 5223 Architectural Graphics 3
ARC 6903 Educational Praxis 3
ARC 6872 Research in Interior Architecture 2
ARC 7006 Reflective Practice Studio 6

Second Year

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<td>Interior Design Theory</td>
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<td>Current Issues in Interior Design</td>
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<tr>
<td>ARC 6004</td>
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Third Year

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MASTER OF INTERIOR DESIGN – 4+3 TRACK
TOTAL CREDIT HOURS: 79
This 4+3 Track of the Master's Degree in Interior Design is for people who hold at least a Bachelor's Degree in another discipline.

First Year

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<td>ART 1225</td>
<td>Visualization Techniques</td>
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<td>ARC 2813</td>
<td>Electronic Methodologies I</td>
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<td>ARC 3613</td>
<td>History of the Designed Environment 1</td>
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<tr>
<td>ARC 3623</td>
<td>History of the Designed Environment 2</td>
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<td>ARC 2313</td>
<td>Building Systems 1</td>
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<td>ARC 2323</td>
<td>Building Systems 2</td>
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<td>ARC 3413</td>
<td>Environmental Systems 1</td>
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Second Year

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<td>ARI 4113</td>
<td>History of Furniture</td>
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<td>ARI 4103</td>
<td>Graphics</td>
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<td>ARI 4123</td>
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26
ARCHITECTURE AND DESIGN COURSE DESCRIPTIONS

Master of Architecture Professional Degree Program, Master of Architecture Post-Professional Degree Program, Master of Interior Design Degree Program

The following courses are offered as part of the sequence of required and elective courses for the fulfillment of the professional and post-professional degrees.

ARC5010 SUMMER THESIS SEMINAR
Prerequisite: Graduate standing. Intensive review and development of a design thesis proposal which defines the topic of thesis research, responds to the latitude of realism and/or theory which is expected by the thesis advisors, and outlines the scope and degree of abstraction, and investigates issues of architectural form and theory raised in the design of a single and/or complex of buildings. Upon acceptance, the student is qualified to pursue the thesis program. Sem. 1 hr. 0 hours credit

ARC5012 RESEARCH METHODS
Prerequisite: Graduate standing. Intensive study of research methodologies to familiarize students with a variety of research methods. Recent and ongoing research in environmental design and behavioral sciences, and methods being used in contemporary design issues. Utilizes computer applications in design research. Sources of research include educational, governmental, professional, and legal environments; and the private sector. Sem. 2 hrs. 2 hours credit

ARC5113 ARCHITECTURAL DESIGN 7 – TYPOLOGY
Prerequisite: Graduate standing. Intensive faculty-directed design studio of a typological architectural problem. The theory of typology as it relates to the problem and generally to architecture. Graded by a selected jury. Studio 6 hrs. 3 hours credit

ARC5123 ARCHITECTURAL DESIGN 8 – DESIGN COMPETITION
Prerequisite: Graduate standing. Intensive self-disciplined design studio based on a student’s choice of an appropriate national or international design competition. Studio 4 hrs. 3 hours credit

ARC5222 ARCHITECTURAL GRAPHICS
Prerequisite: Graduate standing. Introduction to selected media and methods available to design, produce and reproduce creative communications emphasizing laboratory methodology related to short run reprography, typography, image transfer photography, and document finishing and binding through the application of principles of graphic design and layout. Architectural marketing tools compose the specifics for study including logo development, brochure, resume and newsletter design. Focus on communication of marketing information as transmitted through words, symbols and photographic images, including those computer generated. Studio 3 hrs. 2 hours credit

ARC5412 ENVIRONMENTAL ISSUES
Prerequisite: Graduate standing. The history of the natural environmental systems and how they have affected/influenced the evolution of the built environment. The current state of the environment and society’s response on political, social and individual levels to the current and future development of the built environment, more specifically, architecture. The professional role and responsibility of the architect in society today as it relates to environmental issues to foster a level of awareness and understanding on the part of the future practitioner or academic. Challenging or championing those issues as they relate to architecture. Readings, reports, and projects generate discussion of environmental issues. Although course is conducted as a seminar, lectures on relevant topics generate discussion and bring issues to the forefront for debate and review. Sem. 2 hrs. 2 hours credit

ARC5422 ENVIRONMENTAL AND BUILDING REGULATIONS
Prerequisite: Graduate standing. The complex and ever changing area of developmental laws, ordinances and controls as they apply to environmental development. Focus on building codes origin and application. Various state and federal controls as they affect building types. Sem. 2 hrs. 2 hours credit

ARC5432 ENERGY MANAGEMENT
Prerequisite: Graduate standing. Methods of energy conservation in new and existing buildings. Improvements in the building envelope; heating, ventilating, and air conditioning equipment; electrical power and lighting systems discussed and analyzed using computer programs. Benefits of alternative energy systems and electrical load management. Indoor air quality and code considerations examined in context of energy management. Sem. 2 hrs. 2 hours credit

ARC5512 ADVANCED STRUCTURAL SYSTEMS
Prerequisite: ARC4533, Graduate standing. Advanced analysis of building loads (dead, live, wind, earthquake, etc.) leading to the understanding of structural design methodologies that would provide building stability in varying situations. Methods of analysis for responding to requirements for lateral stability due to wind or earthquakes, and development of long-span systems (one and two-way). The structural behavior of shell and space systems. Analyses and design of related structures include use of computer technology. Lect. 2 hrs. 2 hours credit
ARC5514 THESIS 1
Prerequisites: ARC5010, Graduate standing. Co-requisite: ARC5412. Advanced study, original research and data collection on a previously selected and approved topic. A program of inquiry devised by the student is analyzed in depth and substantive alternative conceptual directions are generated towards solution. Students expand and develop a year-long personalized program of concentration, in consultation with an assigned thesis advisor, exploring architectural issues not only of personal interest, but also of general importance to the design discipline. Studio 4 hrs. 4 hours credit

ARC5524 THESIS 2
Prerequisite: ARC5514, Graduate standing. The student continues to pursue the thesis topic by developing one of the alternatives generated from Thesis 1 into a fully documented final design solution. Continued personal input, feedback and guidance are offered by the student’s thesis advisor. During this semester the advisor functions only as a counselor, and the student’s evaluation and grading is by a non-Lawrence Tech faculty jury from the architectural profession. Studio 4 hrs. 4 hours credit

ARC5612 FORM AND MEANING
Prerequisite: Graduate standing. Relationship between architectural form and meaning. A broad range of both sacred and secular examples are discussed, dating from early structures to modern examples. The relationship between cultural/religious beliefs and architectural expression is established and placed within each example’s historical context. Sem. 2 hrs. 2 hours credit

ARC5632 ARCHITECTURAL THEORY
Prerequisite: Graduate standing. Meaning, place and making in architecture through the theoretical writings and built/unbuilt work of various 20th century architects. Presented in the context of 20th century thought, society, and culture. The synthesis of theory and practice. Seminar format with required papers. Sem. 2 hrs. 2 hours credit

ARC5712 ECONOMIC AND COMMUNITY DEVELOPMENT
Prerequisite: Graduate standing. Underlying basic economic and political forces which shape economic and community development. The role of the private sector, developers, financial institutions, and businesses; and public sector, municipal, state, and federal activities. Loan and grant programs, and job/agency responsibilities. Sem. 2 hrs. 2 hours credit

ARC5722 REAL ESTATE LAW
Prerequisite: Graduate standing. Real estate from the legal perspective. Real estate transactions, zoning, land use, and current issues in development. The unique qualities of real property as they pertain to the legal process. Legal and commercial aspects of real estate activities. Sem. 2 hrs. 2 hours credit

ARC5732 REAL ESTATE PRACTICE
Prerequisite: Graduate standing. General survey of modern real estate practice. Economic, business, and legal aspects of land development and use. Financial, marketing, management, and investment aspects of the real estate decision process. The real estate industry and the inter-relationship of its several participants. Sem. 2 hrs. 2 hours credit

ARC5832 PRESERVATION ISSUES
Prerequisites: Graduate standing, and seniors with a minimum GPA of 2.75 and instructor permission. Technical, political, legal and design issues in historic structures, districts, and sites as well as their appropriate application. Conducted as a seminar with participants involved in the discussion of the theories, ethics, standards, and responsibilities of those working in the preservation field and with existing structures. Reading assignments, discussion, lectures, and a research paper. Sem. 2 hrs. 2 hours credit

ARC5842 ADVANCED COMPUTER APPLICATIONS
Prerequisites: ARC4833 or instructor approval, Graduate standing. A platform to advance in an individual but focused direction in computer applications. Explore a new area of computer interest or expand on an area of interest initially pursued in the professional degree thesis project. Combines seminar and applied/theoretical research. Sem. 2 hrs. 2 hours credit

ARC5853 COLLABORATIVE URBAN DESIGN
Prerequisites: Graduate standing, and seniors with a minimum GPA of 2.75 and instructor permission. A graduate studio open to qualified seniors. Projects in urban and architectural design for local cities. Students and faculty work directly with municipal officials and residents in an intense studio setting that comprises surveys, community visioning sessions, research, individual and group design, public preservation/exhibitions, and typically the publication of the results. Opportunity to research contemporary urban design issues and further design skills through a “real world” project. Studio 6 hrs. 3 hours credit

ARC5913 PROFESSIONAL PRACTICE 1
Prerequisite: Graduate standing. The architectural professional and roles in the building industry; theoretical and practical functions of office practice as a business, including the management and planning activities, organizational structure, provision of professional services, business liabilities and legal responsibilities are studied. The requirement for an intensive post-graduate intern development program is emphasized. State licensing officials review adminis-
tative aspects of licensure. The architect as a socially responsible designer, business person and developer in a variety of undertakings. Lect. 3 hrs. 3 hours credit

ARC5922 PROFESSIONAL PRACTICE 2
Prerequisites: ARC5913, Graduate standing. Intensive review of the critical elements of design and technical competency required in preparation to take the architectural licensing examination, with emphasis on exercises in short duration problem solving. The requirement for an intensive post-graduate intern development program is emphasized. Practicing professionals review technical aspects of licensure. Sem. 2 hrs. 2 hours credit

ARC5942 PROJECT MANAGEMENT
Prerequisite: Graduate standing. Advanced study of project management theory, methods, and strategy including professional service management, financial planning and control with special emphasis on the viewpoint of total project organizational direction. Sem. 2 hrs. 2 hours credit

ARC5952 CONSTRUCTION MANAGEMENT
Prerequisite: Graduate standing. Comprehensive study of construction management services, including project planning, scheduling, budgeting, contract administration, and agreements. Comparison between traditional construction delivery systems and the commonly used fast tracking and delivery systems and the complexities involved in the process. The project or research topic may be undertaken as either an individual or team effort. (Note: Prior to registration, students must provide a written “Plan of Study” for approval by the dean, graduate administrator, and professor teaching the course.) Sem. 2 hrs. 2 hours credit

ARC5962 LAW FOR ARCHITECTS
Prerequisite: Graduate standing. Legal aspects of architecture, engineering, and the construction process, including the court system and jurisdictional issues. Various forms of property ownership relating to owner responsibilities. Contract interpretation issues, including issues relative to codes and construction custom and practice as well as forms of liability avoidance for the practicing architect. Applicable statutes of limitations and statutes of limitations may be undertaken as either an individual or team effort. (Note: Prior to registration, students must provide a written “Plan of Study” for approval by the dean, graduate administrator, and professor teaching the course.) Sem. 2 hrs. 2 hours credit

ARC6012 THEATER TECHNOLOGY
Prerequisite: Graduate standing. The art of stage lighting design and the variety of fixtures and equipment. Light as a tool to establish and change moods and situations on stage. How a script is analyzed for lighting needs, and the creation and control of light in production situations. Students undertake design projects and participate in required crew sessions. Sem. 2 hrs. 2 hours credit

ARCHITECTS

ARC6103 MASTER CLASS
Prerequisites: Graduate standing, completion of thesis sequence if in MArch, professional degree program, or a professional degree in architecture. A leading professional guides an advanced student who has prepared a carefully considered response to an architectural problem. Discussions focus on communication about sense-making and sense-realizing of student work in progress, and may also communicate understandings applicable to other architectural and professional practice in general. May be offered in architecture, urban design, and landscape architecture. Studio 4 hrs. 3 hours credit

ARC6302 ADVANCED CONSTRUCTION MANAGEMENT
Prerequisite: Graduate standing. Advanced study of construction management techniques of the building industry with emphasis on the interaction of the architect, construction management, and owner in the development of procedures ensuring the timely completion of projects. The critical roles of municipalities and supplier organizations in the proper planning and execution of construction management projects. Case studies analyzed. Guest lecturers interact with students in group discussions. Sem. 2 hrs. 2 hours credit

ARC6412 ARCHITECTURAL ISSUES
Prerequisite: Graduate standing. Intensive investigation of issues of contemporary American architecture leading to insightful ways of thinking, providing, and occupying architecture. Sem. 2 hrs. 2 hours credit

ARC6822 RESEARCH IN INTERNATIONAL STUDIES I
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of the topic by the professor teaching the class, graduate administrator, and the dean prior to registration. Student-managed research or project on a selected architectural or environmental topic of international interest. Students coordinate their activities with a selected graduate faculty member who acts primarily as a facilitator in monitoring the process. The project or research topic may be undertaken as either an individual or team effort. (Note: Prior to registration, students must provide a written “Plan of Study” for approval by the dean, graduate administrator, and professor teaching the course.) Sem. 2 hrs. 2 hours credit

ARC6823 RESEARCH IN INTERNATIONAL STUDIES II
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of the topic by the professor teaching the class, graduate administrator, and the dean prior to registration. Student-managed research or project on a selected architectural or environmental topic of international interest. Students coordinate their activities with a selected graduate faculty member who acts primarily as a facilitator in monitoring the process. The project or research topic may be undertaken as either an individual or team effort. (Note: Prior to registration, students must provide a written “Plan of Study” for approval by the dean, graduate administrator, and professor teaching the course.) Sem. 3 hrs. 3 hours credit
ARC6833 RESEARCH IN PRESERVATION & EXISTING STRUCTURES
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of topic by the professor teaching the course, graduate administrator, and the dean prior to registration. Student-managed research or project on a selected architectural or environmental topic of interest in historic preservation and existing structures. Students coordinate their activities with a selected graduate degree faculty member who acts primarily as a facilitator in monitoring the process. The project or research topic may be undertaken as either an individual or team effort. (Note: Prior to registration, students must provide a written “Plan of Study” for approval by the dean, graduate administrator and professor teaching the course.) Sem. 3 hrs. 3 hours credit

ARC6853 RESEARCH IN PRACTICE AND MANAGEMENT
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of topic by the professor teaching the class, graduate administrator, and the dean prior to registration. Student-managed research or project on a selected architectural or environmental topic of practice and management. Students coordinate their activities with a selected graduate faculty member who acts primarily as a facilitator in monitoring the process. The project or research topic may be undertaken as either an individual or team effort. (Note: Prior to registration, students must provide a written “Plan of Study” for approval by the dean, graduate administrator and professor teaching the course.) Sem. 3 hrs. 3 hours credit

ARC6872 RESEARCH IN INTERIOR ARCHITECTURE
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of topic by the professor teaching the class, graduate administrator, and the dean prior to registration. Student-managed research or project on a selected architectural or environmental topic of Interior Architecture. Students coordinate their activities with a selected graduate degree faculty member who acts primarily as a facilitator in monitoring the process. The project or research topic may be undertaken as either an individual or team effort. Sem. 2 hrs. 2 hours credit

ARC6881 INDEPENDENT STUDY
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of topic prior to registration. Student-managed research or project on a selected architectural or environmental topic of interest. Students are expected to coordinate their activities with a selected graduate degree faculty member who will act primarily as a facilitator in monitoring the process. The topical study must not reiterate the content associated with any other course listed in the Catalog. The project or research topic may be undertaken as either an individual or team effort. (Note: Students must provide a written “Plan of Study” for approval by the dean, graduate administrator and faculty advisor prior to registration.) Sem. 1 hr. or Studio 2 hrs. 1 hour credit

ARC6883 INDEPENDENT STUDY
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of topic prior to registration. Student-managed research or project on a selected architectural or environmental topic of interest. Students are expected to coordinate their activities with a selected graduate degree faculty member who acts primarily as a facilitator in monitoring the process. The topical study must not reiterate the content associated with any other course listed in the Catalog. The project or research topic may be undertaken as either an individual or team effort. (Note: Students must provide a written “Plan of Study” for approval by the dean, graduate administrator and faculty advisor prior to registration.) Sem. 3 hrs. or Studio 6 hrs. 3 hours credit

ARC6884 INDEPENDENT STUDY
Prerequisites: Graduate standing, minimum GPA of 3.00, and written approval of topic prior to registration. Student-managed research or project on a selected architectural or environmental topic of interest. Students are expected to coordinate their activities with a selected graduate degree faculty member who acts primarily as a facilitator in monitoring the process. The topical study must not reiterate the content associated with any other course listed in the Catalog. The project or research topic may be undertaken as either an individual or team effort. (Note: Students must provide a written “Plan of Study” for approval by the dean, graduate administrator and faculty advisor prior to registration.) Sem. 4 hrs. or Studio 8 hrs. 4 hours credit
ARC6903 EDUCATIONAL PRAXIS
Prerequisite: Graduate standing.
The relationship between architectural practice and the creative process examining a diversity of learning processes, including curriculum integration, learning styles and the culture of the studio using a case study approach. Lect. 3 hrs. 3 hours credit

ARC6912 PRACTICE MANAGEMENT
Prerequisite: Graduate standing. Advanced study of the architectural profession and its role in the building industry. The architect’s professional responsibilities and how they impact on other professionals, contractors, and owner organizations. Emphasis on the architect’s response to the technical, social, and legal obligations of practice through the use of good planning, organizational and communications skills. Case studies analyzed. Practicing professionals interact with students in group discussions. Lect. 2 hrs. 2 hours credit

ARC7006 REFLECTIVE PRACTICE STUDIO
Prerequisites: Professional degree in architecture or enrollment in the M.Arch. Professional degree program, completion of thesis sequence, and approval of the dean. Post-professional degree studio organized as a vehicle for students and a leading design practitioner to engage in the process of framing problems from architectural practice. This studio engages interdisciplinary professionals, clients and municipal officials as part of its intention to form a bridge between the world of theoretical frameworks, practice oriented research and design-driven professional practice. Studio 6 hrs. 6 hours credit

ARI5113 INTERIOR ARCHITECTURE
GRADUATE STUDIO
Prerequisites: AR13115 or Department Permission. A comprehensive interior architecture studio that develops projects in retail, hospitality, and residential. Studio 6 hrs. 3 hours credit

ARI5143 LIGHTING DESIGN AND RESEARCH
Prerequisites: AR14143 or Department Permission. An advanced course in lighting that examines a specific topic of research that will be the basis of a design project. Lec. 1 hr. Studio 4 hrs. 3 hours credit

ARI5612 INTERIOR DESIGN THEORY
Prerequisites: ARC3613, ARC3623, ARH113 or Department Permission. An examination of the historical, political, environmental, social and psychological issues that impact the development of interior design theory and philosophy. Sem. 2 hrs. 2 hours credit

ARI5622 CURRENT ISSUES IN INTERIOR DESIGN
Prerequisite: Graduate Standing. A seminar focusing on specific issues that impact the interior design profession and practice. Sem. 2 hrs. 2 hours credit

ARI5873 ADVANCED INTERIOR ARCHITECTURE
Prerequisite: Graduate standing and seniors with a minimum GPA 2.75 who have successfully completed ARC4234 Allied Studio: Interiors. Students explore current issues in interior architecture and develop a project that focuses on a specific issue. Studio 4 hrs. 3 hours credit

LLT8012 LITERATURE OF THE BUILT ENVIRONMENT
Prerequisite: Graduate standing. Impact of the built environment on the minds and feelings of the people who create and live in it. Imaginative writing, discursive literature, and narrative art forms from biblical times through the 20th century. Selected literature gives a strong personal sense of what it is like to inhabit man-made structures of varying scale and complexity and to live in an environment created by an agglomeration of buildings. While exploring the psychological impact of the built environments as expressed by the best writers, students also become aware of how structures may influence demographic and social change. The symbolic dimension of the built environment. Sem. 2 hrs. 2 hours credit

MGT7123 TOPICS IN MANAGEMENT
Prerequisite: Graduate standing. Topic or topics of current interest in the management field. Course may focus on a single topic or it may cover a wide variety of topics, at the discretion of the faculty member. Repeat enrollment for different topics is permitted. Lect/Sem. 3 hrs. 3 hours credit

SSC8012 SOCIAL RESPONSIBILITY AND COMMUNITY ACTION
Prerequisite: Graduate standing. Relationship of political, economic, and legal aspects of community and design environments, and the roles of government in the urban economy. Community constraints on design, including legal and political limits on community action. Concludes with an integrative case study. Sem. 2 hrs. 2 hours credit
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S101, 248.204.3500

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Gonzalo Munevar
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Linda Wareck
instructional technologist, VITRC

Kent Woiak
supervisor, service engineering team, Cadillac Division, General Motors Corp.
DEGREE PROGRAMS OFFERED

Lawrence Tech’s College of Arts and Sciences offers these graduate programs:
• M.S. Computer Science
• M. Science Education
• M.S. Technical Communication

PROGRAM POLICIES

Grades awarded in graduate courses are limited to A, A-, B+, B, B-, C+, C, and F. At most one passing grade below B- may be counted toward a graduate degree. No more than one required course may be repeated. If a course is repeated, the student’s GPA will reflect both grades earned and is not subject to recomputation. Courses numbered 5000 and above require a minimum grade of B- in each prerequisite course.

MASTER OF SCIENCE IN COMPUTER SCIENCE

The Master of Science in Computer Science differs from traditional master’s degree programs in that it emphasizes applied concepts and reinforces these applications in laboratories. Examples are drawn from business and industry, finance, and scientific research.

The program has been designed so that students can select structured sequences of options to give them advanced training in selected fields of computer science. A choice of six areas of concentration are available. Students must complete two:
• Software Engineering –
  The development methodology of programming and testing in the large programming environments.
• Intelligent Systems –
  Developing computational systems that exhibit abilities to recognize sensory inputs, adapt by learning, and facilitate appropriate actions (intelligent behavior) in complex and changing environments.
• Data Base Systems –
  Advanced training and experience in working with distributed data base systems and client/server models.
• Distributed Systems –
  The theoretical underpinnings of distributed computing and practical implementations of LANS, WANS, internets and intranets.
• Programming Languages –
  The foundations of how communication between human and machine is accomplished.
• Computer Graphics –
  Theory and application of representing, displaying and designing virtual objects and environments.

This applied degree program is intended for students from three populations:
1. recent college graduates with degrees in computer science wishing to gain advanced knowledge and skill in the area of applied computing;
2. employed computer professionals seeking to further their technical competencies; and
3. those with bachelor’s degrees in non-computer areas seeking entry into the computer science field.

M.S.C.S. PROGRAM OBJECTIVES

To give students a thorough understanding of the theoretical concepts and practical uses of computer science, the program emphasizes practical applications.

Hands-on, applied classes reinforce these concepts. Extensive experience in newly renovated computer science laboratories, as opposed to pencil-and-paper classroom work, is stressed.

The program’s goal is to provide highly skilled professionals in a field essential to industry and to economic growth. It is clear that the effective implementation of computer-based technologies is the basis for future economic growth and for the career prospects of technical experts and managers. The market for those with computer science expertise is booming now and most likely will thrive in the future.

M.S.C.S. ADMISSIONS

Admission to the M.S.C.S. requires:
1. A baccalaureate degree that includes one year of mathematics and one year of science;
2. An official transcript of all completed college work;
3. An overall undergraduate GPA of at least 3.00 on a 4.00 scale;
4. Completion of the following pre-core sequence of undergraduate courses or their equivalencies:

Pre-Core Courses  Credit Hours
Computer Science 1  4
Computer Science 2  4
Discrete Math  3
Data Structures  4
Computer Architecture and Assembly Programming  3

M.S.C.S. DEGREE REQUIREMENTS

Students must have a plan of study, arranged in consultation with an advisor and approved by the program director. The 30 credit hour program includes:

Core Courses: (Students must complete sequences in two areas of concentration for a total of at least 12 credits. Each sequence is comprised of at least two courses.)
1. Software Engineering (6 credits)
   MCS5103 Software Engineering
   MCS6123 Adv Topics in Software Engineering
2. Intelligent Systems (6 credits)
   MCS5503 Intelligent Systems
   MCS6513 Adv Topics in Intelligent Systems
3. Database Systems (6 credits)
   MCS5303 Database Systems
   MCS6323 Adv Topics in Database Systems
4. Distributed Computing (6 credits)
   MCS5703 Intro to Distributed Computing
   MCS6723 Adv Topics in Distributed Computing
5. Programming Language Concepts (6 credits)
   MCS5043 Programming Language Implementation
   MCS6043 Adv Topics in Programming Languages
6. Computer Graphics (6 credits)
   MCS5203 Intro to Computer Graphics
   MCS6223 Adv Topics in Computer Graphics
Capstone Project: (For a total of 6 credits)
MCS7013 Collaborative Research Project 1
MCS7033 Collaborative Research Project 2

Bridge courses: (Students with insufficient background in computer science may have to complete the following courses for a total of at most 9 credits. Students taking the pre-core sequence at Lawrence Tech will not be required to take MCS5003.)
MCS5003 Essentials of Computer Science
MCS5233 Theory of Computation
MCS5253 Operating Systems

Elective Courses: (The remaining credit hours can be taken from the computer science courses on the following pages or courses approved by the program director. Total credit hours in this category will range from 3 to 12 based on the number of bridge courses taken.)

M.S.E. PROGRAM OBJECTIVES

The objectives of the M.S.E. program are:
- To provide teachers with a broad base of scientific knowledge appropriate for K-12 school instruction, as well as techniques and tools that allow successful learning of scientific concepts to their students.
- To provide teachers with scientific knowledge and updated teaching techniques (often immediately applicable in the classroom) that will help them create a classroom environment where science is exciting, challenging, student-centered, and inquiry-driven.
- To provide certified teachers with the graduate educational experience needed to obtain the professional certificate, and K-7 or 8-12 Science (DX) endorsement.

M.S.E. ADMISSIONS

Admission to the M.S.E. program requires:
1. A baccalaureate degree;
2. An official transcript of all completed college work;
3. A resume, including experience and extracurricular activities;
4. A list of three references;
5. An admissions interview with the program director.

M.S.E. TRANSFER CREDIT

Not more than nine (9) graduate semester credit hours of science will be transferred.

M.S.E. DEGREE REQUIREMENTS

All students must have a plan of study, arranged in consultation with an advisor and approved by the program director.
Candidates for the degree must complete 30 credit hours from the following list of courses, with 21 of these credits from the core curriculum. All degree-seeking students must take courses SCE6103 Introductory Seminar and SCE6303 Capstone Project.

Core Courses Credit Hours
SCE6103 Introductory Seminar 3
GLG6143 Geosphere or GLG6243 Atmos, Weather 3
PHY6323 Astronomy 3
SCE6303 Capstone Project 3
One Life Science Course 3
One Physics Course 3
One Chemistry Course 3

Elective Courses
BIO6173 Cells and Organisms 3
BIO6273 Heredity and Evolution 3

MASTER OF SCIENCE IN TECHNICAL COMMUNICATION

The Master of Science in Technical Communication (M.S.T.C.) is designed as a professional, practice- and theory-oriented program of graduate study that prepares students for careers in leadership roles in the field of technical communication.

PROGRAM OVERVIEW

Purpose and Objectives
The Master of Science in Technical Communication (M.S.T.C.) is designed as a comprehensive, practice- and theory-oriented program of graduate study that will prepare students for leadership, management, and consulting roles in the fields of technical and professional communication.

Depending on the emphasis of their course of study and professional interests, graduates of the M.S.T.C. will be able to acquire skills and expertise to:
- Design, produce, and evaluate the various types of technical and professional communication required by diverse audiences

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td>BIO6353</td>
<td>General Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BOT6163</td>
<td>Botany and Ecology of Plants</td>
<td>3</td>
</tr>
<tr>
<td>CHM6153</td>
<td>Matter, Energy, and Their Changes</td>
<td>3</td>
</tr>
<tr>
<td>CHM6253</td>
<td>Materials and their Uses</td>
<td>3</td>
</tr>
<tr>
<td>GLG6243</td>
<td>Atmosphere, Weather, and Climate</td>
<td>3</td>
</tr>
<tr>
<td>PHY6123</td>
<td>Motion, Forces and Energy</td>
<td>3</td>
</tr>
<tr>
<td>PHY6223</td>
<td>Electricity, Magnetism, and Waves</td>
<td>3</td>
</tr>
<tr>
<td>SCE6213</td>
<td>Foundations of Science</td>
<td>3</td>
</tr>
<tr>
<td>PHY6423</td>
<td>Science of Music</td>
<td>3</td>
</tr>
</tbody>
</table>
• Use verbal, visual, analytical, and computer skills to create and enhance communication in professional environments
• Apply major rhetorical theories of technical and professional discourse to a variety of communication environments
• Apply emerging electronic technologies and other media to the creation of various publications and presentations
• Gain insight into the current research methodologies applicable to the fields of technical and professional communication
• Supervise publications, information design, and information management functions in organizations
• Master presentation techniques that are adaptable to multiple audiences
• Additionally, some students may wish to prepare for doctoral-level work in technical and professional communication to obtain academic, corporate leadership, or research positions.

M.S.T.C. PROGRAM OBJECTIVES

Depending on the emphasis of their course of study, graduates from the M.S.T.C. can pursue a variety of careers and specialties:
• Design, produce, and evaluate the various kinds of technical communication required by diverse audiences.
• Use language, visual, analytical, and computer skills to create and enhance communication in scientific and technical environments.
• Apply the major rhetorical theories of technical discourse to the practice of technical communication.
• Apply emerging electronic technologies and other media to the creation of technical communication.
• Apply research methodologies to advancing knowledge and practices in the field of technical communication.
• Supervise a publications department or publications functions in an organization.
• Organize and manage teams for problem solving and decision making.
• Make presentations to multifaceted audiences using multiple technologies.
• Create, implement, and train others in the design of documents, Web pages, and multimedia.

Additionally, some students may wish to pursue doctoral level work in technical communication, with the goal of obtaining academic or corporate training or research positions.

M.S.T.C. ADMISSIONS

In addition to the policies and procedures described in the “Academic Regulations” section of this Catalog, admission to the M.S.T.C. requires:
1. A baccalaureate degree from an accredited college or university
2. Official transcripts of all completed college work
3. An overall undergraduate GPA of at least 3.00 on a 4.00 scale (students with lower GPAs may occasionally be accepted on a probationary status)
4. A resume that includes academic and professional experience
5. One or more writing samples that demonstrate the applicant’s skills in either technical or professional communication. Professional portfolios may also be submitted.

6. Three letters of recommendation, including one from either a professor or a corporate supervisor. The supervisory letter must be written by someone who has worked with the applicant in either an academic or corporate environment during the past three years and who is familiar with the applicant’s professional promise; and
7. An admissions interview with the program director or a designated faculty member

Applicants with less than a 3.00 GPA and those with undergraduate degrees from academic backgrounds other than technical communication will be admitted on a conditional basis. Students accepted conditionally are evaluated for official graduate student status upon completion of nine (9) semester hours of graduate coursework at Lawrence Tech.

M.S.T.C. TRANSFER CREDIT

1. No more than six (6) graduate semester credit hours may be transferred, and these must be from accredited M.S., M.A., or Ph.D. programs in communication.
2. A request for courses to be considered for transfer must be made in writing at the time of application.
3. A minimum grade of 3.00 must have been achieved in the transfer courses.
4. Courses must have been completed within five years of the application for admission.

Candidates for the M.S.T.C. degree must have completed the equivalent of 30 semester hours within the M.S.T.C. curriculum as defined in this catalog. Six (6) of these hours may be approved transfer credits. Students must have a cumulative GPA of 3.00 in all courses for them to be applied toward the degree.

In the semester prior to their anticipated graduation, candidates for the M.S.T.C. degree must meet with their academic advisor to ensure that they have met all program requirements and to complete the graduation application paperwork.

MASTER OF SCIENCE IN TECHNICAL COMMUNICATION (M.S.T.C.)

Required Courses (6 courses, totaling 18 semester hours):
COM6103 Foundations of Technical Communication
COM6443 Rhetoric of Technical Communication
# College of Arts and Sciences

## Master of Science in Computer Science

### Course Descriptions

**COM5003 Essentials of Computer Science**  
Prerequisite: Approximately five years of professional software development. Concepts of computer science for the experienced software developer. Topics from MCSI514, MCSI5214, MCSI5254, MCSI5253, and MCSI53663 are highlighted. Lect. 3 hrs. 3 hours credit.

**MCS5013 Web Programming**  
Prerequisite: MCSI5234  
Introduction to the Web-server basis; Web authoring using HTML; Advanced Web authoring with dynamic HTML, XML; JavaScript programming; CGI programming in C, C++ and Perl. Introduction to ASP and the middle tier. Lect. 3 hrs. 3 hours credit.

**MCS5023 Java Programming**  
Prerequisite: MCSI503 or permission of department chair. An advanced course in Java programming. Advanced multi-threading, multimedia and graphics. Networking and RMI. Database access with Java. Java Beans and EJB. Servlets and JSP. Multi-tier application development using CORBA. Java and embedded systems. JINI. Current topics in Java technology. Lect. 3 hrs. 3 hours credit.

**MCS5033 Object Computing**  
Prerequisite: MCSI5234.  

**MCS5043 Programming Language Implementation**  
Prerequisites: MCSI5234, MCSI5463, and MCSI5363.  
Substantial programming experience is required. Issues associated with the design and implementation of higher-level programming languages. Concentrations are theory behind different components of a compiler, programming techniques used to put the theory into practice, and the interfaces used to modularize the compiler. Course project on compiler design and implementation. Lect. 3 hrs. 3 hours credit.

**MCS5053 Computability**  
Prerequisite: MCSI5233 or MCSI5463.  
The second course on theory of computation. Introduces decidability, computability, and computational complexity. Church’s Thesis; undecidability; reducibility and completeness; recursive functions; time complexity and NP-completeness. Lect. 3 hrs. 3 hours credit.

**MCS5083 Visual Programming**  
Prerequisite: MCSI5234.  
Introduction to Windows programming. Principles of human-computer interaction. Graphical user interface programming. Event driven programming. Developing help systems. Evaluation techniques. Windows programming environments such as MFC and UNIX. Introduction to various RAD tools. Lect. 3 hrs. 3 hours credit.

**MCS5103 Software Engineering**  
Prerequisite: Permission of department chair. Selection of programming language; debugging techniques and tools; program maintenance; software economics; team programming and its application to projects; software life cycle. Lect. 3 hrs. 3 hours credit.

**MCS5203 Introduction to Computer Graphics**  
Prerequisite: MCSI503 or permission of department chair.  
Introduction to fundamental computer graphics issues, hardware, algorithms, and software. Scan-conversion line generators; scanline polygon; affine transformation; viewing and clipping; illumination and rendering; solid modeling; curves and surfaces; texture mapping; collision detection; animation; issues of virtual environment applications. Lect. 3 hrs. 3 hours credit.

**MCS5213 Computational Geometry**  
Prerequisites: MCSI2414, MCSI3503. Implicit and explicit representations of curves in the plane; vectors and transformations; curves and surfaces in space. Splines and other representations. Computational issues in intersection, minimum distance, edge detection and projection algorithms. Lect. 3 hrs. 3 hours credit.

**MCS5223 Computer Aided Geometric Design**  
Prerequisite: MCSI5213. Bezier and NURBS representations of curves and surfaces. Properties of B-splines and resulting algorithms. Designing curves and surfaces. Issues surrounding topology, trimmed surfaces and triangulation. Other representations. Lect. 3 hrs. 3 hours credit.
MCS5233 INTRODUCTION TO THEORY OF COMPUTATION  
Prerequisite: MCS2524. A beginning course on theory of computation. Regular languages; finite automata; context-free languages; turing machine; Chomsky hierarchy; applications to parsing. Lect. 3 hrs. 3 hours credit

MCS5253 OPERATING SYSTEMS  
Prerequisite: Graduate standing and MCS2534 and MCS3653 or MCS3663. Principles of operating systems. Storage management systems. Interrupts, paging, swapping, protection, file management. Lect. 3 hrs. 3 hours credit

MCS5303 INTRODUCTION TO DATABASE SYSTEMS  
Prerequisite: Permission of department chair. Design and implementation of relational, hierarchical and network database systems. Query/update data languages, conceptual data model, physical storage methods, database system architecture and normal forms. Database security and integrity. Relational database systems are emphasized. A project involving an on-line database system is normally assigned. No credit given after MIS6113. Lect. 3 hrs. 3 hours credit

MCS5403 ROBOTICS PROGRAMMING  
Prerequisite: MCS2534. Characteristics of real-time computing. Introduction to robotics, control theories, modeling finite state machines, design methodologies for real-time systems, process synchronization using semaphores, Lego robots and developing robot programs using various programming languages and different real-time operating systems for autonomous mobile robots such as Khepera and Lego RIS. Lect. 3 hrs. 3 hours credit

MCS5503 INTELLIGENT SYSTEMS  

MCS5523 VIRTUAL ENVIRONMENT AND SCIENTIFIC VISUALIZATION  
Prerequisite: Technical proficiency in one of: architecture design, programming, modeling, or painting. A project based hands-on course. Teams with members of varied backgrounds build immersive virtual worlds to solve real world scientific visualizations problems. Lect. 3 hrs. 3 hours credit

MCS5703 INTRODUCTION TO DISTRIBUTED COMPUTING  
Prerequisite: Permission of department chair. Introduction to data communications, network models, topologies and structures. Includes the OSI model, transport mediums (routers, bridges, gateways), and an overview of communication protocols, particularly TCP/IP. Lect 3 hrs. 3 hours credit

MCS6043 ADVANCED TOPICS IN PROGRAMMING LANGUAGES  
Prerequisite: MCS5043 or MCS4643 or MCS6063. Advanced topics in the area of programming language design and implementation. Lect. 3 hrs. 3 hours credit

MCS6063 FOUNDATIONS OF PROGRAMMING LANGUAGES  
Prerequisite: MCS3633. Study of mathematical models of programming languages in different paradigms through formal semantics (operational and denotational) and type systems (polymorphism, inference, and abstract types). Lect. 3 hrs. 3 hours credit

MCS6223 ADVANCED TOPICS IN COMPUTER GRAPHICS  
Prerequisite: MCS2503 or permission of director. Seminar in computer graphics. Discussion of literature, current theoretical developments, implementations, and applications in the field. Lect. 3 hrs. 3 hours credit

MCS6323 DISTRIBUTIVE DATABASE SYSTEMS  
Prerequisite: MCS3503. Relational operators; dependency theory; project-join mappings; representation theory; query optimization; null values; distributed databases; concurrency control. Distributed databases; networking; office information systems; distributed vision applications. Lect. 3 hrs. 3 hours credit

MCS6343 CURRENT DEVELOPMENTS IN DATABASE SYSTEMS  
Prerequisite: MCS6323. Seminar in database management systems. Discussion of current papers in the field. Sem. 3 hrs. 3 hours credit
### MCS6513 ADVANCED TOPICS IN INTELLIGENT SYSTEMS
**Prerequisite:** MCS5503. Advanced topics in artificial intelligence and computational intelligence. Advanced evolutionary computation. Advanced neural networks. Advanced fuzzy logic systems. Introduction to neuro-fuzzy systems and soft computing. Practical applications of computational intelligence to wireless devices, web programming, robotics and data mining. Lect. 3 hrs. 3 hours credit

### MCS6523 EXPERT SYSTEMS
**Prerequisite:** MCS5503. Advanced topics in development and implementation of intelligent systems; knowledge acquisition and representation for expert systems; design of adaptable expert systems that learn; relevant papers from the current literature discussed. Lect. 3 hrs. 3 hours credit

### MCS6543 CURRENT DEVELOPMENTS IN INTELLIGENT SYSTEMS
**Prerequisite:** MCS6523. Seminar in intelligent systems. Presentation and application of current technology in the field. Sem. 3 hrs. 3 hours credit

### MCS6723 ADVANCED TOPICS IN DISTRIBUTED COMPUTING
**Prerequisite:** MCS5703. A continuation of MCS5703. Advanced topics in the area of distributed and network computing. Topics include routing, addressing, implementations of LANS and WANS. Lect. 3 hrs. 3 hours credit

### MCS6743 CURRENT DEVELOPMENTS IN DISTRIBUTED COMPUTING
**Prerequisite:** MCS6723. Seminar in distributed computing. Discussion of current papers in the area, as well as case studies of current implementations. Sem. 3 hrs. 3 hours credit

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### BIO6273 HEREDITY AND EVOLUTION
**Prerequisite:** 0. Heredity and evolution. Reproduction, meiosis, chromosomes, genes, and dominant and recessive traits. Mendel’s laws of biological heredity. Molecular biology featuring the functions of DNA and RNA in transmitting the genetic code. Genetics as one way to understand the process of evolution. Evolution provides a unifying theme for understanding the history of life on earth. Class 2 hrs., two days/week. 3 hours credit

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### CHM6153 MATTER, ENERGY, AND THEIR CHANGES
**Prerequisite:** 0. Introduces basic ideas about the structure of matter and its behavior. Why diverse materials have predictable properties, based on atomic theory. The arrangement of electrons in atoms, which determine the chemical properties of the elements. Chemical changes and transformation of chemical energy into other forms of energy. Human’s relationship to fuels and their energy storage capacity. Hands-on activities for major concepts in chemistry used throughout the course. Class 2 hrs., two days/week. 3 hours credit
CHM6253 MATERIALS AND THEIR USES
Prerequisite: CHM6153 or program director approval.
Chemistry concepts and how they apply to everyday situations. Chemistry of polymers, industry, food, environment, and life. Environmental chemistry topics include acid rain, the greenhouse effect, ground-water pollution, and oil spills. The relationships among chemical concepts and scientific reasoning, research methods and practical applications are illustrated during the students’ participation in solving a hypothetical industrial research problem. Hands-on activities for major concepts in chemistry used throughout the course. Class 2 hrs., two days/week. 3 hours credit

GLG6143 GEOSPHERE
Prerequisite: 0. Concepts necessary to understand how the earth works as an active planet, and how this knowledge is crucial to our lives: for example, the influence of geology on the very existence of life on earth; the dependence of all human civilizations on rocks and minerals; the limits on the earth’s resources; and the fragile nature of the earth’s environments in which we live. Course is based on long-range collaborative projects. Class 2 hrs., two days/week. 3 hours credit

GLG6243 ATMOSPHERE, WEATHER, AND CLIMATE
Prerequisite: 0. The atmosphere surrounding the earth, how energy from the sun interacts with the earth and the atmosphere to produce weather patterns, and the effects of the weather on our environment. How to take advantage of current technology to utilize information from weather satellites, the weather channel, and other resources. How to best utilize information easily available from newspapers and local weather forecasts. Class 2 hrs., two days/week. 3 hours credit

PHY6123 MOTION, FORCES, AND ENERGY
Prerequisite: 0. Motion, forces, and momentum, work, and energy. The meaning of Newton’s Laws. Participation in activities that demonstrate how these fundamental laws of physics apply to many of our everyday activities. Students use, in the classroom, computers and other technological tools. Classes follow a “workshop” format that combines lecture, laboratory, group activities, and the opportunity for individuals to construct physical concepts in their own way. Class 2 hrs., two days/week. 3 hours credit

PHY6223 ELECTRICITY, MAGNETISM, AND WAVES
Prerequisite: 0. Fundamental principles of electricity, magnetism, and wave motion, and the roles of electricity and magnetism in our civilization. Electricity provides most of our lighting and heating. Magnetism is involved in the operation of almost all motors. Most of the energy used on the earth comes from the sun through electromagnetic waves. Since sight is dependent on wave motion, behavior of light is analyzed. Class 2 hrs., two days/week. 3 hours credit

PHY6323 ASTRONOMY
Prerequisite: 0. Earth’s view of the sky. Emphasis on how astronomers understand celestial phenomena through the analysis of light, the application of the known laws of physics, and the use of logic and experiment. Students construct solar system models to enhance their understanding and make sky observations with the naked eye and telescopes. Current theories of the beginning and development of the universe. Part of this course uses the planetarium and telescope at the Cranbrook Institute of Science. Class 2 hrs., two days/week. 3 hours credit

PHY6423 SCIENCE OF MUSIC
Prerequisite: 0. A study of the principles of waves and sound through the use of music and its creation by strings, air columns, rods, and membranes. The inner structure of the human ear and its ability to observe will also be addressed, together with some of the psychological effects of sound. Class 2 hrs., two days/week. 3 hours credit

SCE6103 INTRODUCTORY SEMINAR
Prerequisite: 0. The teaching philosophy that integrates methods of teaching and learning with content is examined. This philosophy permeates all course work in this program. Model learning experiences are facilitated using the most appropriate strategies to “teach” a content-specific concept. Each experience focuses on an important concept from each of the following areas: life science, physical science, and earth and sky science. The nature of science, the scientific world view, and methods of scientific inquiry. Model experiences include teaching strategies that promote equity by emphasizing knowledge useful to all and by providing information about how people of all races and cultures have contributed to science. Class 2 hours, two days/week. 3 hours credit

SCE6113 FOUNDATIONS OF MUSIC
Prerequisite: 0. Introduces the nature of science, scientific reasoning, and a paradigm view of specific sciences. Activities and projects in which students reflect on science, the scientific method, and scientific tools. Students research the contribution of diverse cultures to science by exploring science history to discover the relationship of science and technology to social and economic environment. They explore ethical issues that scientists face and the paradigm shifts in the development of science. Project-based use of collaborative teams, which require students to construct their own knowledge, used throughout this course. Class 2 hrs., two days/week. 3 hours credit

SCE6203 COMPUTER APPLICATIONS FOR EDUCATION
Prerequisite: 0. Addresses the selection and implementation of educational software packages and utilization of internet resources in the classroom. Involves student development of computer generated instructional materials for the classroom and other educational settings. 3 hrs. 3 hours credit

SCE6223 DISTANCE LEARNING THROUGH TECHNOLOGY
Prerequisite: 0. Students further their knowledge of the Internet and utilize learning resources on the world wide web. How to design interactive home pages to enhance and serve the educational needs of their own students. Lect. 1 hour, Lab 2 hours. 3 hours credit
SCE6303 CAPSTONE PROJECT
Prerequisite: Completion of 24 credit hours. A student-driven course, with faculty members acting as an advisory committee for the selection and evaluation of a master project. The project usually requires the student to plan instruction based on the prior knowledge and conceptualizations of middle school students and on the application of current research on childhood and adolescent learning in science. The project should use this research in the development of classroom experiences that promote the use of science processes and problem-solving skills. When applicable, a variety of instructional strategies, curriculum materials, and equipment, including electronic educational technology, computers, interactive video, and telecommunications, are used. Sem. 3 hrs. 3 hours credit

SCE6313 APPLIED INSTRUCTIONAL TECHNOLOGY
Prerequisite: SCE6203. Students apply various instructional technology strategies in the design and development of units in their field of expertise to be used in the classroom. Lect. 1 hr, Lab 2 hrs. 3 hours credit

SCE6991-6993 DIRECTED STUDY IN SCIENCE EDUCATION
Prerequisite: Permission of the director of the Master of Science Education program or the department chairman of Natural Sciences. Research or special studies under the direction of a staff member in a topic relevant to Science Education. Sem. 3 hrs. 3 hours credit

MASTER OF SCIENCE IN TECHNICAL COMMUNICATION
Required Courses:

COM6103 FOUNDATIONS OF TECHNICAL COMMUNICATION
Prerequisite: Admission to the M.S.T.C. and COM5103 or permission of instructor. Offers overview of the fundamental techniques, theories, and research from a variety of fields that relate to the study and practice of technical communication. It covers the historical and social context of technical communication, technical discourse analysis, as well as issues in usability, audience reception, visual, and oral communication. Lect./Sem. 3 hrs. 3 hours credit

COM6443 RHETORIC OF TECHNICAL COMMUNICATION
Prerequisite: COM6103 or permission of the instructor. Addresses rhetorical dimension and impact of technical communication upon diverse audiences. The rhetorical aspects of technical communication are explored with special attention given to verbal technical communication (both written and oral), visual technical communication, web design, and other electronically mediated communication. Lect./Sem. 3 hrs. 3 hours credit

COM6453 RESEARCH METHODS AND APPLICATIONS
Prerequisite: COM6103 or permission of the instructor. Focuses on examination of the materials available for research in technical and professional communication. Also emphasized are the analysis and application of qualitative, quantitative, and mixed methods approaches to research. Evaluating and reporting research results are integral to course discussions and presentations. Lect./Sem. 3 hrs. 3 hours credit

COM6473 ADVANCED PUBLICATION DESIGN
Prerequisite: COM5963 or permission of the instructor. Emphasizes the layout and design of technical and professional documents, presentation support materials, and electronic media. Also, a review of current research on the effects of text and visual media is conducted. Lect./Sem. 3 hrs. 3 hours credit

COM5963 WEB SITE DESIGN
Prerequisite: COM6103 or permission of the program director. Provides comprehensive introduction to the principles and practices relating to content and graphic design for web sites. Students analyze the design process and examine technical and usability factors affecting presentations on the Web. Lect./Sem. 3 hrs. 3 hours credit

COM6123 PROFESSIONAL PRESENTATION STRATEGIES
Prerequisite: COM6103, COM6443 or permission of the instructor. Examines rhetorical approaches to professional presentation. The use of structured reasoning, debates in technical professions, and public/social argumentation is included. After individual evaluation, students deliver a comprehensive presentation to be critiqued by a professional audience. Lect./Sem. 3 hrs. 3 hours credit

COM6553 ADVANCED INTERPERSONAL COMMUNICATION
Prerequisite: COM6103 or permission of the instructor, Corequisite: COM6453. Explores the theories and applications of interpersonal communication as they relate to professional environments. Effective listening, perception, verbal and nonverbal communication, conflict management, and leadership skills are emphasized. Lect./Sem. 3 hrs. 3 hours credit

COM7203 TECHNICAL COMMUNICATION PRACTICUM
Prerequisite: COM6103, COM6443, COM6453, or permission of the program director. Offers the opportunity to select one of six supervised project options in technical and professional communication. Among these options are the preparation and presentation of a scholarly work, a curriculum development project, and design of a communication campaign. 3 hours credit

Electives:

COM6443 RHETORIC OF TECHNICAL COMMUNICATION
Prerequisite: COM6103 or permission of the instructor. Addresses rhetorical dimension and impact of technical communication upon diverse audiences. The rhetorical aspects of technical communication are explored with special attention given to verbal technical communication (both written and oral), visual technical communication, web design, and other electronically mediated communication. Lect./Sem. 3 hrs. 3 hours credit

COM6453 RESEARCH METHODS AND APPLICATIONS
Prerequisite: COM6103 or permission of the instructor. Focuses on examination of the materials available for research in technical and professional communication. Also emphasized are the analysis and application of qualitative, quantitative, and mixed methods approaches to research. Evaluating and reporting research results are integral to course discussions and presentations. Lect./Sem. 3 hrs. 3 hours credit

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Prerequisite: COM6103 or permission of the instructor, Corequisite: COM6453. Explores the theories and applications of interpersonal communication as they relate to professional environments. Effective listening, perception, verbal and nonverbal communication, conflict management, and leadership skills are emphasized. Lect./Sem. 3 hrs. 3 hours credit
COM6463 TEAM PROBLEM SOLVING AND DECISION MAKING
Prerequisite: COM6103 or permission of the instructor. Explores theories of problem solving and decision making in the workplace. Students examine case studies, leadership skills, and conflict management in relation to theoretical precepts. Lect./Sem. 3 hrs. 3 hours credit

COM6483 MANAGING ORGANIZATIONAL COMMUNICATION
Prerequisite: COM6103 or permission of the instructor. Focuses on the management of communication programs and campaigns in a variety of organizational frameworks. Students gain familiarity with traditional and innovative approaches to shaping organizational structures and communication teams. They also analyze the various organizational roles and responsibilities of technical and professional communication managers. The impact of emerging technologies on communication is also studied. Lect./Sem. 3 hrs. 3 hours credit

COM6493 COMMUNICATING ACROSS CULTURES
Prerequisite: COM6103 or permission of the instructor. Current readings in intercultural and international studies will be analyzed. Among the topics given special emphasis are globalization and localization in business practices, computer-mediated communication, and comparative analysis of world norms, practices, and biases. Students conduct individual research projects focusing on current issues in intercultural communication. Lect./Sem. 3 hrs. 3 hours credit

COM6543 TECHNICAL AND PROFESSIONAL EDITING
Prerequisite: COM6103 or permission of the instructor. Focuses on professional editorial techniques, which lead to the application of editing skills to a variety of rhetorical situations and media. Lect./Sem. 3 hrs. 3 hours credit

COM6563 ADVANCED NONVERBAL COMMUNICATION
Prerequisite: COM6103, COM6443, COM6553 or permission of the instructor. Explores the complexities of nonverbal communication, which extend to gender and culture. It also examines the practices, power, and dynamics of this form of communication, which includes body language, proxemics, chronemics, and facial cues. Lect./Sem. 3 hrs. 3 hours credit

COM6943 ONLINE COMMUNICATION
Prerequisite: COM6103 or permission of the instructor. Covers the techniques and skills required for designing and publishing help systems and Web sites. It also examines the dimensions and strategies of computer-assisted communication. Lect./Sem. 3 hrs. 3 hours credit

COM6963 MULTIMEDIA DESIGN AND ANALYSIS
Prerequisite: COM6103, COM5963, COM6443 or permission of the instructor. Covers skills for incorporating multimedia techniques (integration of text, sound, graphics, animation, and video) in technical and professional communication projects. Students also examine the value and potential of multimedia strategies, and the role of the technical communicator in implementing these strategies. Lect./Sem. 3 hrs. 3 hours credit

COM7103 SPECIAL TOPICS COURSES
Prerequisite: COM6103 or permission of the instructor. These courses investigate a wide range of current theories and practices in technical and professional communication. Examples include:
- Publication and Graphic Design Software Applications
- Medical Writing
- Proposal Writing
- Legal Writing
- Rhetorical Analysis and Presentation
- Advanced Business and Professional Communication

3 hours credit
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LAIRD E. JOHNSTON,
E99, 248.204.2500

Associate Dean:
RICHARD S. MASLOWSKI,
E99, 248.204.2500

Assistant Dean
NABIL F. GRACE,
E23, 248.204.2545

Program Directors:
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E40, 248.204.2572
D.E.M.S.: Khalil S. Taraman,
E154, 248.204.2565
M.S.Auto.Eng.: Suresh C. Bansal,
E33, 248.204.2563
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E20, 248.204.2538
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M.S.E.C.E.: Richard Johnston,
E-215B, 248.204.2534
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E31, 248.204.2580

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Assistant Professors:
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Chris H. Riedel

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Suraji Bhonsle
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Robert Fletcher
Sanaa Taraman

Adjunct Faculty:
Additional lecturers are assigned to selected courses and sections based on their particular specialties and expertise and are listed in the faculty roster.

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Sanaa Taraman

Adjunct Faculty:
Additional lecturers are assigned to selected courses and sections based on their particular specialties and expertise and are listed in the faculty roster.

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College of Engineering

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Dan Tyner
section supervisor, Visteon Automotive Systems, Climate Control Systems
Sin-Min Yap
product design engineer, Ford Motor Co.
Monir Kamal
retired, General Motors Corp.

Degree Programs Offered:

Lawrence Tech’s College of Engineering offers these graduate programs:

• Doctor of Engineering in Manufacturing Systems
• Master of Civil Engineering
• Master of Science in Civil Engineering
• Master of Construction Engineering Management
• Master of Engineering Management
• Master of Engineering in Manufacturing Systems
• Master of Science in Automotive Engineering
• Master of Science in Electrical and Computer Engineering
• Master of Science in Mechanical Engineering
• Certificate of Manufacturing Systems

DOCTOR OF ENGINEERING IN MANUFACTURING SYSTEMS (D.E.M.S.)

Lawrence Technological University’s Doctor of Engineering in Manufacturing Systems (D.E.M.S.) program has been developed for engineers who are interested in acquiring a high level of technical competence in the field of manufacturing systems. Where once the master’s degree was seen as the ultimate credential, an increasing number of industry leaders recognize the depth and breadth of competence afforded through preparation at the doctoral level.

Lawrence Tech’s D.E.M.S. program is unique in these aspects:

• All engineers accepted into this program work full-time in the Detroit metropolitan area—one of the leading and most technologically advanced manufacturing areas in the world;
• The program requires an internship similar to the medical profession. The internships in industry are utilized to solve real manufacturing systems problems in manufacturing;
• Each engineer in the D.E.M.S. program has two advisors—an academic advisor who provides state-of-the-art knowledge about engineering principles, and an industrial advisor who provides significant industrial experience and support.

D.E.M.S. CURRICULUM REQUIREMENTS

Number and Distribution of Credit Hours

Applicants who earned a Bachelor of Engineering are required to complete the following 84 credit hours for their D.E.M.S. degree. These 84 credit hours could be completed in as few as five years beyond the Bachelor of Engineering attending part-time.

1. 24 credits Foundation in Manufacturing Systems (M.E.M.S. or equivalent)

Email: 0103 Engineering Materials
EME6203 Manufacturing Processes
EME6303 Computer Integrated Manufacturing
EME6403 Quality Control
EME6503 Manufacturing Productivity
EME6603 Engineering Economics

EME6703 Manufacturing Systems
MGT6013 Leadership and Management

II. 18 credits Doctor of Engineering in Manufacturing Systems (D.E.M.S.) Core

EME7103 Design of Experiments
EME7203 Manufacturing Systems Simulation
EME7303 Design for Reliability
EME7403 Design for Manufacturing
EME7503 Process Control
EME7603 Strategic Planning

III. 12 credits Electives

IV. 30 credits Dissertation – EME800X

D.E.M.S. ADMISSIONS

Applicants must be engineering leaders who have abilities to identify society’s needs and creativity in solving problems economically.

D.E.M.S. is designed for engineers with a high level of technical competence. A Master of Engineering degree (with at least a 3.4 GPA) is required. All applicants must demonstrate strong potential for success based upon:

• Transcripts of engineering studies;
• Three letters of recommendation;
• Resume;
• Essay outlining applicant’s goal to achieve D.E.M.S.;
• Personal interview.

For more information, contact the program director, (248) 204-2565, or the Office of Graduate Admissions, (248) 204-3160.
D.E.M.S. REQUIREMENTS FOR CONTINUING MATRICULATION

Advising
- Doctoral students are advised during their first nine credit hours by the director of the program;
- An academic D.E.M.S. advisor must be chosen after the student completes 42 credit hours;
- The academic D.E.M.S. advisor works with the student to identify a sponsoring company;
- The industrial D.E.M.S. advisor will secure the industrial internship;
- Both advisors supervise the student to achieve D.E.M.S. objectives

D.E.M.S. DISSERTATION PROPOSAL

Development of the dissertation must start after completing 42 credit hours beyond the bachelor’s degree. A dissertation proposal presentation must be submitted within six months from the start of the internship. The proposal should include (but not be limited to):
- Background on the industrial problem;
- Problem definition;
- State-of-the-art survey;
- Possible solutions;
- Resources needed;
- Action plan to solve the problem.

D.E.M.S. PROPOSAL EXAMINATION

A Doctoral Committee, appointed by the dean of engineering in consultation with the manufacturing systems director, includes five members:
- The Academic Advisor (Chair);
- The Industrial Advisor;
- Two graduate faculty from the College of Engineering;
- A Lawrence Tech graduate faculty member from outside the College of Engineering.

The proposal examination is a public event. Two attempts are allowed. Failure in the second attempt will result in the candidate’s termination in the D.E.M.S. program. The student becomes a D.E.M.S. degree candidate after passing the examination; the successful D.E.M.S. candidate will implement the action plan as presented or modified by the Doctoral Committee.

D.E.M.S. REQUIREMENTS FOR COMPLETION OF DEGREE

D.E.M.S. Dissertation
The dissertation will contain the solution to the manufacturing problem: the result may be a new manufacturing related device, process, or system for which a high level of scholarship, engineering, and ingenuity are required to find the solution.

Dissertation Credits
Students who have finished 42 credit hours of their courses are eligible to register for a three credit hour course (EME8003) to develop the D.E.M.S. proposal. After students succeed in the D.E.M.S. proposal examination, they must register for 27 additional credit hours while they are working on solving the identified problems. Grades in EME8003 are recorded as incomplete “I” and converted to a letter grade only after the successful completion of the D.E.M.S. final examination.

MASTERS IN CIVIL ENGINEERING (M.C.E. and M.S.C.E.)

In the spirit of addressing the serious infrastructure problems facing the metro Detroit area as well as the state and nation, the M.C.E./M.S.C.E. program at Lawrence Tech was developed around “Civil Engineering the Infrastructure.” The program is intended for the practicing civil engineer, but with the proper selection of courses, it may be the prelude to additional graduate work.

Specializations are available in: Environmental, Geotechnical, Hydraulic, and Structural Engineering. Other specializations, including Transportation Engineering, are being considered. A Master of Construction Engineering Management is also available through the Civil Engineering Department (in collaboration with the College of Management) and is described elsewhere in this Catalog.

Courses may be taken in any or all of the specializations as the student wishes. The degree consists of 30 credits including a three-credit project or a six-credit thesis (an option usually reserved for funded research projects). Alternatively, students can complete 33 credits of course work (without completing a project or thesis). Successfully completing the thesis option qualifies the student to receive a Master of Science in Civil Engineering.

All course work is offered in the late afternoon or evening, with normal program completion time in approximately two years. Most courses are offered one night per week starting at 5:45 p.m. or later. Students are required to take at least one of the three core infrastructure courses. These courses directly address infrastructure problems, systems, and economics/management. In addition, students are required to take three one-credit participatory seminars. The remaining courses necessary to complete the total required credits may be selected from architecture, engineering, management, mathematics, or science offerings with the approval of the graduate advisor.
M.C.E./M.S.C.E. Core Courses:
ECE6011-31 Civil Engineering Seminar
ECE6123 Infrastructure Problems and Solutions
ECE6143 Infrastructure Systems
ECE6163 Infrastructure Cost and Management

Environmental Engineering Specialization:
ECE5323 Environmental Cleanup
ECE5333 Air Pollution Control
ECE5343 Advanced Environmental Engineering
ECE5353 Environmental Management
ECE5363 Surface Water Quality Management
ECE5393 Special Topics in Environmental Engineering

Geotechnical Engineering Specialization:
ECE5423 Geoenvironmental Engineering
ECE5433 Ground Improvement Methods for Foundations
ECE5453 Practicum In Geotechnical Engineering
ECE5463 Earthquake Engineering
ECE5473 Earth Retaining Structures
ECE5493 Special Topics in Geotechnical Engineering

Hydraulic Engineering Specialization:
ECE5523 River Engineering
ECE5533 Coastal Engineering
ECE5543 Urban Hydraulics
ECE5553 Ports And Harbors
ECE5593 Special Topics in Hydraulic Engineering

Structural Engineering Specialization:
ECE5713 Analysis and Design of Prestressed Concrete
ECE5723 Advanced Analysis and Design of Structures
ECE5733 Finite Element Analysis For Structural Engineering
ECE5743 Introduction to Structural Dynamics
ECE5753 Advanced Concrete Design
ECE5763 Advanced Composite Materials And Their Uses In Structures
ECE5793 Special Topics in Structural Engineering

General Courses:
ECE5911-3 Graduate Directed Study
ECE5923 Special Topics in Civil Engineering
ECE6053 Graduate Project
ECE6073 Thesis I
ECE6083 Thesis II

The credit requirements are summarized as follows:

Project Option (M.C.E.):
Infrastructure Core (1 course) 3 credits
Civil Engineering Seminar (1 cr X 3) 3 credits
Technical Electives (7 courses) 21 credits
Project 3 credits
Total Credit Hours 30 credits

Thesis Option (M.S.C.E.):
Infrastructure Core (1 course) 3 credits
Civil Engineering Seminar (1 cr X 3) 3 credits
Technical Electives (6 courses) 18 credits
Thesis 6 credits
Total Credit Hours 30 credits

Course Work Option (M.C.E.):
Infrastructure Core (1 course) 3 credits
Civil Engineering Seminar (1 cr X 3) 3 credits
Technical Electives (9 courses) 27 credits
Total Credit Hours 33 credits

M.C.E./M.S.C.E. Admissions

Admission to the MCE/MSCE program as a regular graduate student requires:
1. An earned B.S. degree in civil engineering (or equivalent) from an ABET-accredited undergraduate program;
2. Minimum undergraduate GPA of 3.00;
3. Demonstration of high potential for success based on the following documents:
   a. Graduate and Professional Programs Application for Admission;
   b. Three letters of recommendation (employer and professor are preferred);
   c. Official transcripts of all college work;
   d. Professional resume; and
   e. Statement of intent.

Applicants who do not meet all conditions for regular admission may be considered for conditional admission upon review by the Engineering Graduate Admission Committee. A conditional student will typically be granted regular status after receiving a minimum grade of “B” (3.0) in three consecutive graduate level courses. Non-engineering graduates may be admitted to the program, but may be required to take additional courses as specified by the program advisor.

M.C.E./M.S.C.E. Transfer Procedure:

A maximum of six semester hours of graduate engineering courses taken at other accredited engineering colleges may be transferred, provided they are deemed relevant by the Engineering Graduate Admissions Committee. Courses to be transferred must have been taken within the past five years and a grade of “B” (3.00) or better must have been achieved. The student should petition the Engineering Graduate Admissions Committee by letter prior to completion of the first semester of graduate work. The student must submit evidence in addition to transcripts in the form of syllabi and examinations for each transfer course proposed. The Committee may require the applicant to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.

Up to six credits from other departments at the University can be applied towards the Master of Civil Engineering with the approval of the graduate advisor. In addition, graduate students are allowed to apply up to six credits of 4000-level civil engineering courses (senior-level electives) to their masters Degree with the approval of the graduate advisor.
A Master of Construction Engineering Management (M.C.E.M.) is offered through Lawrence Tech’s Civil Engineering Department. Degree requirements include courses from both the Department of Civil Engineering and the M.B.A. program at Lawrence Tech. This collaboration between the College of Engineering and the College of Management provides a unique innovative degree program.

The program’s objective is to provide specialized education suitable to the needs of students interested in both the concepts of construction engineering and the principles of management. The synthesis of these two fields represents a highly specialized and marketable combination of skills. The degree aims to provide well-rounded training for the specialized field of construction engineering management.

The degree requirements consist of 30 credits including 18 credits of required core courses, six to nine credits of management electives from the College of Management, and three to six credits of technical electives.

Core Courses (18 credits)

- ECE5213 Project Management Techniques
- ECE5223 Techniques of Project Planning and Control
- ECE5233 Advanced Construction Techniques and Methods
- ECE5243 Construction Accounting and Finance
- ECE5253 Risk Management and Personnel
- ECE5273 Construction Law

Management Electives (6-9 credits from the College of Management)

Selected courses must be pre-approved by the MCEM Program Director and the College of Management. Suggested courses include:

- MGT6013 Leadership/Management
- MGT6053 Perspectives in International Business
- MGT6233 Business Strategies/ E-Commerce
- MKT6023 E-Market and Global Economy
- HRM5023 Leading Organizational Change
- HRM6113 Management and Organization Development
- HRM6133 Managing the Project Organization

Technical Electives (3-6 credits)

- ECE5263 International Construction
- ECE5283 Advanced Cost Estimating Techniques
- ECE5293 Special Topics in Construction Engineering
- ECE5613 Sustainable Construction Practices
- ECE5353 Environmental Management
- ECE5913 Graduate Directed Study

Selected courses must be pre-approved by Program Advisor.

Other graduate courses from civil engineering or other related fields may be applied towards technical electives requirement. Selected courses must be pre-approved by Program Advisor.

M.C.E.M. ADMISSIONS

Admission to the M.C.E.M. program as a regular graduate student requires:

1. An earned B.S. degree in civil engineering (or technical field) from an ABET-accredited undergraduate program;
2. Minimum undergraduate GPA of 3.00;
3. Demonstration of high potential for success based on:
   a. Graduate and Professional Programs Application for Admission;
   b. Three letters of recommendation (from employers and professors preferred);
   c. Official transcripts of all college work;
   d. Professional resume; and
   e. Statement of intent.

Applicants who do not meet all conditions for regular admission may be considered for conditional admission upon review by the Engineering Graduate Admission Committee. A conditional student will typically be granted regular status after receiving a minimum grade of “B” in three consecutive graduate level courses.

Non-engineering graduates may be admitted to the program, but may be required to take additional course as specified by the program advisor.

M.C.E.M. TRANSFER PROCEDURE

A maximum of six semester hours for graduate engineering courses taken at other accredited engineering colleges may be transferred, provided they are deemed relevant by the Engineering Graduate Admissions Committee. Courses to be transferred must have been taken within the past five years and a grade of “B” (3.00) or better must have been achieved. The student should petition the Engineering Graduate Admissions Committee by letter prior to completion of the first semester of graduate work. The student must submit evidence in addition to transcripts in the form of syllabi and examinations for each transfer course proposed. The Committee may require applicants to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.

In addition, up to 12 credits of the CEM degree can be applied towards the M.B.A. program at Lawrence Tech.
Lawrence Technological University’s Master of Engineering Management (M.E.M.) program provides opportunities for students with diverse technical backgrounds to enhance their undergraduate education.

The program, which totals 36 credit hours, is designed for full-time students and working professionals who are graduates of technical fields such as engineering, engineering technology, physics, chemistry, mathematics and computer science.

The MEM program is a cross-disciplinary program in the engineering and management fields with the objective to provide students with

• The technical knowledge and skills required to manage technical and engineering functions.
• Greater exposure and opportunities to interact with other professionals from different disciplines in the industry.
• Skills to enhance their professional careers.

All course work can be taken in the evening, allowing working students to complete their studies in approximately two years. Most courses meet once or twice a week for two and a half hours, usually starting around 5:45 p.m. The following seven courses form the program’s core, (21 credit hours.)

### M.E.M. ADMISSIONS

Admission to the M.E.M. program as a regular graduate student requires:
1. Hold a B.S. in engineering, engineering technology, science, mathematics, computer science from an accredited college or university;
2. Provide official transcripts of all completed college work;
3. Have earned an overall GPA of at least 3.0 on a 4.0 scale;
4. Submit a graduate application form; and
5. Submit three letters of recommendation.

Applicants who do not meet all conditions for regular admissions may be admitted on a provisional basis as determined by the M.E.M. Graduate Admissions Committee. The applicant will be evaluated for official graduate student status upon completion of six (6) semester hours of graduate coursework, achieving a minimum grade of 3.00 in each course, at the university.

Students with provisional admission status may be required to take additional prerequisites to meet the program admission requirements.

### M.E.M. TRANSFER PROCEDURE

For applicants transferring from other graduate programs into the M.E.M. program, no more than six (6) graduate semester credit hours may be transferred from an accredited M.E.M. program. Any exceptions to this policy must be approved by the M.E.M. Graduate Admissions Committee. A minimum grade of 3.00 must have been achieved in all transfer courses. Credit for courses taken in a graduate program will be reviewed to determine whether they may be substituted within the M.E.M. program. A request for transfer courses to be considered must be made in writing at the time of application to the M.E.M. program and must be accompanied by transcripts, course descriptions, and syllabi for each proposed transfer course.
MASTER OF ENGINEERING IN MANUFACTURING SYSTEMS

Lawrence Tech’s Master of Engineering in Manufacturing Systems (M.E.M.S.) is designed for working professionals who are graduates of an ABET-accredited undergraduate engineering program and who have at least one year of experience in industry. All course work can be taken in the evening. Each course meets once per week for two and one-half hours, usually starting at 5:45 p.m. This schedule permits the M.E.M.S. candidate to complete all degree requirements in approximately two years.

Lawrence Tech’s M.E.M.S. program emphasizes the vital relationships and interplay between manufacturing, engineering, research, suppliers, marketing, sales, and management. The program is designed to help students understand the systematic relationships that pervade the modern manufacturing process. It stresses the important interaction between manufacturers and suppliers that is key to improving industrial output. The program seeks to strengthen the ability of practicing engineers to develop, design, and effectively utilize manufacturing systems to produce a quality product at the least cost.

The combination of Lawrence Tech’s practical orientation, academic experience, resources in this specialized field, and convenient accessibility is unrivaled in the area.

M.E.M.S. is an inter-disciplinary program administered by Lawrence Tech’s College of Engineering. It draws upon the best resources of the entire University. The heart of the program consists of the following eight core courses:

- **EME6103** Engineering Materials Manufacturing Processes
- **EME6203** Computer Integrated Manufacturing
- **EME6303** Quality Control
- **EME6403** Manufacturing Productivity
- **EME6503** Engineering Economics
- **EME6603** Manufacturing Systems
- **EME6703** Leadership and Management

Electives are often chosen to meet students’ interests as indicated by a survey. Electives that have been offered include:

- **EME5113** Polymer Materials and Processes
- **EME5123** Optimization of Manufacturing Systems
- **EME5253** Engineering Analysis
- **EME6313** Computer Aided Process Planning
- **EME6323** Expert Systems in Manufacturing
- **EME6993** Graduate Directed Study
- **EME7613** Technology Management

Students may also elect engineering courses from other Lawrence Tech masters programs.

Another important facet of the M.E.M.S. program is the student body itself. The M.E.M.S. candidate participates with, learns from, and gets to know other engineers representing a variety of industries, manufacturers, and suppliers. The opportunity to develop both professional and personal relationships with other graduate students has obvious benefits and is encouraged through the participation in the Professional Seminar (EME6901) twice. The credit requirements are summarized as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core (eight courses)</td>
<td>24</td>
</tr>
<tr>
<td>Electives (three courses)</td>
<td>9</td>
</tr>
<tr>
<td>Professional Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Total Credit Hours</td>
<td>35</td>
</tr>
</tbody>
</table>

**M.E.M.S. ADMISSIONS**

Admission to the M.E.M.S. program as a regular graduate student requires:

1. A Bachelor of Science in an engineering program accredited by ABET;
2. Minimum undergraduate GPA of 3.00;
3. Minimum of one year of professional experience after graduation;
4. Demonstration of high potential for success based on the following documents:
   - (a) “Graduate and Professional Programs Application for Admission”;
   - (b) Three letters of recommendation (at least one from an employer documenting professional experience, and one from a professor if the applicant has graduated within the last three years);
   - (c) Official transcripts of all college work completed;
   - (d) A resume including experience and all extracurricular activities.

Applicants who do not meet all of the conditions for regular graduate admission may be considered for conditional admission by the M.E.M.S. Graduate Admissions Committee, provided they demonstrate an exceptionally high aptitude and promise for doing graduate work, and hold a Bachelor of Science degree in engineering. A conditional graduate student will be granted regular status after maintaining a minimum 3.00 GPA in three consecutive graduate level courses.

**M.E.M.S. TRANSFER PROCEDURE**

A maximum of 9 semester hours for graduate engineering courses taken at other accredited engineering colleges may be transferred provided they are deemed relevant by the M.E.M.S. Graduate Admissions Committee. Courses to be transferred must have been taken in the last five years and a grade of “B” (3.00) or better must have been achieved. The student should petition the M.E.M.S. Graduate Admissions Committee by letter prior to completion of the first semester of graduate work. The student must submit evidence in addition to transcripts in the form of syllabi and examinations for each transfer course proposed. The Committee may require the applicant to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.
MASTER OF SCIENCE IN AUTOMOTIVE ENGINEERING

Lawrence Technological University’s Master of Science in Automotive Engineering program is designed for working professionals who are graduates of ABET-accredited undergraduate mechanical or electrical engineering programs. All course work is offered in the evening, allowing working students to complete their studies in approximately two years. Most courses meet once per week for two and one-half hours, usually starting at 5:45 p.m.

Lawrence Tech’s M.S.A.E. program is designed to help students use and improve their automotive engineering leadership skills, encompassing strategic planning, design, product engineering, manufacturing, and engineering management.

A key element of the course work is the concept that the complete automobile is a single system. All other components and component packages are sub-systems, which cannot be changed independently. Woven throughout each course is the recognition that in such a complex system all areas must behave as a single entity to achieve goals. The purposeful use of both full time faculty from Lawrence Tech and current experts from industry provides timely information and engineering knowledge well in advance of many textbooks and periodicals.

This Master of Science degree program derives unique value from Lawrence Tech’s historic relationship with the automotive and manufacturing industries, the University’s philosophical emphasis on the practical application of knowledge, and the extensive utilization of industry experts as teachers and mentors.

An interdisciplinary program administered by the College of Engineering, the M.S.A.E. program consists of ten, three-credit courses: eight core courses and two technical electives (or a Thesis Option). A total of 30 credit hours are required for graduation. Additionally, academic backgrounds of candidates will be evaluated by the admissions committee as part of the admissions process. Students found deficient in a particular subject area are required to enroll in pre-core crossover courses before being allowed to enroll in some of the core program courses. No graduate credit will be granted for these courses. The course sequence is summarized as follows:

**Pre-core Crossover Courses as directed by admissions letter**:
- EME 4613 Introduction to Thermal Systems (non-ME)
- EME 4603 Introduction to Mechanical Systems (non-ME)
- EEE 2123 Circuits and Electronics
- EEE 3153 Electrical Machines and Controls

*Credit is not applied toward the MSAE degree. Pre-core course requirements are determined by the admissions committee during the admissions process.*

**M.S.A.E. Core Courses:**
- EME5253 Engineering Analysis I
- EME6333 Body and Chassis Systems
- EME6343 Automotive Manufacturing
- EME6353 Automotive Mechanical Systems
- EME6363 Automotive Electrical Systems
- EME6373 Powertrain Systems I
- EME6383 Powertrain Systems II
- EME6803 Engineering Management
- EME6813 Engineering Management II
- EME6993 Graduate Directed Study
- EME7513 Advanced Automotive Driveline Systems Design II

In addition, two three-credit technical electives may be chosen from selected 5000 level or higher courses from the Mechanical or Electrical Engineering Departments. Following are some of these select electives:

- EME5103 Fasteners and Bolted Joints
- EME5113 Polymers Materials and Processes
- EME6103 Engineering Materials
- EME6433 Advanced Vehicle Dynamics
- EME6453 Advanced CAD/FEA Engineering
- EME6473 Hybrid Electric Vehicles
- EME6513 Advanced Automotive Driveline Systems Design I
- EME6573 Advanced Automotive HVAC (Heating, Ventilating and Air Conditioning)
- EME6993 Graduate Directed Study
- EME7513 Advanced Automotive Driveline Systems Design II

Students are also allowed to select a thesis option by enrolling in two three-credit-hour thesis courses in lieu of both technical electives. This option provides students with an in-depth experience in one subject area. Students who elect to enroll in the thesis option are required to select a faculty advisor from either the Mechanical or Electrical Engineering Departments. Students may also select an industrial advisor in addition to the faculty advisor; however, a selection of a faculty advisor is mandatory. Students must submit their dissertation to a professional society for publication (i.e. SAE Technical Paper, ASME).
Journal, etc.). Further, all students must make a verbal presentation of their findings.

Students are required to meet regularly with their advisor. All thesis projects will be approved by the program director in addition to the faculty advisor. A copy of the proposal and the project commitment form, signed by the student and the advisor, must be presented to the program director before a student may register in the course. Upon thesis completion, two copies of the dissertation, signed by both the student and advisor, must be presented to the program director. One copy will be maintained by the director and the second shall be held in the Lawrence Tech library.

The student body of practicing engineers, representing a broad variety of automotive related companies and a wide variety of job assignments, provides an important additional learning resource. The students work in teams on assigned projects in many of the courses, learning and enhancing teamwork as well as sharing expertise with one another.

M.S.A.E. credit hour requirements are summarized as follows:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-core as required</td>
<td></td>
</tr>
<tr>
<td>Core courses</td>
<td>24</td>
</tr>
<tr>
<td>Electives/Thesis</td>
<td>6</td>
</tr>
<tr>
<td>Total required</td>
<td>30</td>
</tr>
</tbody>
</table>

M.S.A.E. ADMISSIONS

1. An earned Bachelor of Science degree in mechanical or electrical engineering (or equivalent) from an ABET-accredited university;
2. Minimum undergraduate GPA of 3.00;
3. Demonstration of high potential for success based on the following documents:
   a. Application for Graduate Admission
   b. Three letters of recommendation from an employer, business, and/or faculty;
   c. Official transcripts of all college work completed;
   d. A resume including professional experiences and extracurricular activities;
   e. Statement of purpose that includes personal and professional achievements with in the last five years.

Applicants who do not meet all of the conditions for regular graduate admission may be considered for conditional admission by the M.S.A.E. Admissions Committee, provided they demonstrate an exceptionally high aptitude and promise for doing graduate work in this area and hold a Bachelor of Science degree in engineering. Applicants may be required to take the GRE examination and pass the TOEFL examination.

M.S.A.E. TRANSFER PROCEDURE

A maximum of six semester hours for graduate engineering courses taken at other accredited engineering colleges may be transferred provided they are deemed relevant by the M.S.A.E. Admissions Committee. Courses to be transferred, must have been taken in the last five years and a grade of “B” (3.00) or better must have been achieved. Students should petition the Engineering Graduate Admissions Committee by letter prior to completion of the first semester of graduate work. Students must submit evidence in addition to transcripts in the form of syllabi and examinations for each transfer course proposed. The Committee may require the applicant to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.

M.S.A.E. credit hour requirements are summarized as follows:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-core as required</td>
<td></td>
</tr>
<tr>
<td>Core courses</td>
<td>24</td>
</tr>
<tr>
<td>Electives/Thesis</td>
<td>6</td>
</tr>
<tr>
<td>Total required</td>
<td>30</td>
</tr>
</tbody>
</table>

M.S.A.E. ADMISSIONS

1. An earned Bachelor of Science degree in mechanical or electrical engineering (or equivalent) from an ABET-accredited university;
2. Minimum undergraduate GPA of 3.00;
3. Demonstration of high potential for success based on the following documents:
   a. Application for Graduate Admission
   b. Three letters of recommendation from an employer, business, and/or faculty;
   c. Official transcripts of all college work completed;
   d. A resume including professional experiences and extracurricular activities;
   e. Statement of purpose that includes personal and professional achievements with in the last five years.

Applicants who do not meet all of the conditions for regular graduate admission may be considered for conditional admission by the M.S.A.E. Admissions Committee, provided they demonstrate an exceptionally high aptitude and promise for doing graduate work in this area and hold a Bachelor of Science degree in engineering. Applicants may be required to take the GRE examination and pass the TOEFL examination.

M.S.A.E. TRANSFER PROCEDURE

A maximum of six semester hours for graduate engineering courses taken at other accredited engineering colleges may be transferred provided they are deemed relevant by the M.S.A.E. Admissions Committee. Courses to be transferred, must have been taken in the last five years and a grade of “B” (3.00) or better must have been achieved. Students should petition the Engineering Graduate Admissions Committee by letter prior to completion of the first semester of graduate work. Students must submit evidence in addition to transcripts in the form of syllabi and examinations for each transfer course proposed. The Committee may require the applicant to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.

M.S.A.E. credit hour requirements are summarized as follows:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-core as required</td>
<td></td>
</tr>
<tr>
<td>Core courses</td>
<td>24</td>
</tr>
<tr>
<td>Electives/Thesis</td>
<td>6</td>
</tr>
<tr>
<td>Total required</td>
<td>30</td>
</tr>
</tbody>
</table>

M.S.A.E. ADMISSIONS

1. An earned Bachelor of Science degree in mechanical or electrical engineering (or equivalent) from an ABET-accredited university;
2. Minimum undergraduate GPA of 3.00;
3. Demonstration of high potential for success based on the following documents:
   a. Application for Graduate Admission
   b. Three letters of recommendation from an employer, business, and/or faculty;
   c. Official transcripts of all college work completed;
   d. A resume including professional experiences and extracurricular activities;
   e. Statement of purpose that includes personal and professional achievements with in the last five years.

Applicants who do not meet all of the conditions for regular graduate admission may be considered for conditional admission by the M.S.A.E. Admissions Committee, provided they demonstrate an exceptionally high aptitude and promise for doing graduate work in this area and hold a Bachelor of Science degree in engineering. Applicants may be required to take the GRE examination and pass the TOEFL examination.

M.S.A.E. TRANSFER PROCEDURE

A maximum of six semester hours for graduate engineering courses taken at other accredited engineering colleges may be transferred provided they are deemed relevant by the M.S.A.E. Admissions Committee. Courses to be transferred, must have been taken in the last five years and a grade of “B” (3.00) or better must have been achieved. Students should petition the Engineering Graduate Admissions Committee by letter prior to completion of the first semester of graduate work. Students must submit evidence in addition to transcripts in the form of syllabi and examinations for each transfer course proposed. The Committee may require the applicant to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.

M.S.A.E. credit hour requirements are summarized as follows:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-core as required</td>
<td></td>
</tr>
<tr>
<td>Core courses</td>
<td>24</td>
</tr>
<tr>
<td>Electives/Thesis</td>
<td>6</td>
</tr>
<tr>
<td>Total required</td>
<td>30</td>
</tr>
</tbody>
</table>
M.S.E.C.E. ADMISSIONS

Admission to the M.S.E.C.E. as a regular graduate student requires:
1. A B.S.E.E. or B.S.Comp.Eng degree from an accredited college or university;
2. Minimum undergraduate GPA of at least 3.00;
3. Demonstration of high potential for success based on the following:
   (a) Graduate and professional program application for admission; (b) two letters of recommendation (employer and professor are preferred);
   (c) official transcripts of all completed college work; and
   (d) a professional resume.

Students with less than a 3.00 GPA may be admitted on a provisional basis. They will be evaluated for official graduate student status upon completion of twelve (12) semester hours of graduate coursework at Lawrence Tech. This evaluation will be conducted by the program director and the M.S.E.C.E. Graduate Committee. Students are notified of their status within two weeks of completion of the minimum required hours.

Students with a Bachelor of Science degree in a field other than electrical or computer engineering who have a GPA of at least 3.0 may be admitted on a provisionary basis. These students must satisfy all prerequisite requirements before they can be granted official graduate status. The program director and the Graduate Committee will decide prerequisite requirements.

M.S.E.C.E. REQUIREMENTS

Students must complete 30 semester hours (credits) of coursework, approved by their graduate advisor and the department chair. This coursework must include the four required courses listed below, and fourteen technical elective credit hours, eight hours of which must be at the 6000 level.

**Required Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE5114</td>
<td>Engineering Analysis</td>
<td>4</td>
</tr>
<tr>
<td>EEE5324</td>
<td>Network Synthesis</td>
<td>4</td>
</tr>
<tr>
<td>EEE5444</td>
<td>Digital Communications</td>
<td>4</td>
</tr>
<tr>
<td>EEE5534</td>
<td>Digital Control</td>
<td>4</td>
</tr>
</tbody>
</table>

**Technical Electives**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE5144</td>
<td>Power Distribution Systems</td>
<td>4</td>
</tr>
<tr>
<td>EEE5204</td>
<td>Advanced Computer Architecture</td>
<td>4</td>
</tr>
<tr>
<td>EEE5264</td>
<td>Advanced Microprocessors</td>
<td>4</td>
</tr>
<tr>
<td>EEE5274</td>
<td>Digital Image Processing</td>
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<td>EEE5284</td>
<td>Parallel Architectures</td>
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<td>EEE5354</td>
<td>Analog Integrated Circuit Design</td>
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<td>EEE5364</td>
<td>Computer Networking</td>
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<td>EEE5524</td>
<td>Modern Control Systems</td>
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<td>EEE5554</td>
<td>Applications of Artificial Intelligence</td>
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<tr>
<td>EEE5564</td>
<td>Interfacing and Control of Robots</td>
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<td>EEE5614</td>
<td>Computer-Aided Design of Integrated Circuits</td>
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<td>EEE5624</td>
<td>VLSI Systems Design</td>
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<td>EEE5634</td>
<td>Optical Systems Engineering</td>
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<td>EEE5654</td>
<td>Digital Signal Processing</td>
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<td>EEE5784</td>
<td>Communication Circuits</td>
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<td>EEE5911-4</td>
<td>Directed Study</td>
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<tr>
<td>EEE6314</td>
<td>Computer Vision</td>
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<td>EEE6524</td>
<td>Nonlinear and Optimal Control</td>
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<td>EEE6534</td>
<td>Adaptive Control</td>
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<td>EEE6704</td>
<td>Engineering Optimization</td>
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<td>EEE6784</td>
<td>Advanced Communication Theory</td>
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<tr>
<td>EEE6901-4</td>
<td>Masters Project</td>
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The following are Master of Science in Computer Science (M.S.C.S.) degree electives that may be used as Technical Electives with the approval of an advisor: (See College of Arts and Sciences M.S.C.S. course descriptions for prerequisites)

- Introduction to Distributed Computing (3 credits)
- Advanced Topics in Distributed Computing (3 credits)
- Software Engineering (3 credits)
- Advanced Software Engineering Techniques (3 credits)
- Database Systems (3 credits)
- Advanced Topics in Database Systems (3 credits)
- Intelligent Systems (3 credits)
- Advanced Topics in Intelligent Systems (3 credits)
- Java Programming (3 credits)
M.S.E.C.E. TRANSFER PROCEDURE

A maximum of nine (9) graduate semester credit hours may be transferred, and these must be from an accredited MS program in Electrical, Electrical and Computer, or Computer Engineering program. Credit for courses taken in a graduate program other than those listed above will be reviewed by the program director and the graduate committee for acceptability as a substitute within LTU’s program.

Courses transferred must have been taken in the last five (5) years and a grade of “B” (3.00) or better must have been achieved. All course petitions considered must be made in writing at the time of application.

MASTER OF SCIENCE IN MECHANICAL ENGINEERING

Lawrence Technological University’s Master of Science in Mechanical Engineering (M.S.M.E.) program provides opportunities for students to enhance their undergraduate engineering education. In the diverse field of mechanical engineering, many students find it both necessary and rewarding to pursue a more advanced study of their particular interests and talents to enhance their professional careers. As such, the M.S.M.E. curriculum is structured to prepare graduate students in fields such as combustion engines, emissions, manufacturing processes and systems, structural analysis, vehicle dynamics, powertrain systems, vibrations, fluid dynamics, and engineering design.

The program, which totals 30 credit hours, is designed for full-time students and working professionals who are graduates of an ABET-accredited undergraduate engineering program. All course work can be taken in the evening, allowing working students to complete their studies in approximately two years. Most courses meet once or twice a week for two and a half hours, usually starting around 5:45 p.m. Applicants have a choice between doing a thesis (thesis option) and doing strictly course work (non-thesis option). Pending the approval of the MSME Graduate Committee, working professionals that choose the thesis option can choose a topic in conjunction with their job or company. The following six courses form the program’s core:

- EME5133 Advanced Fluid Mechanics
- EME5143 Internal Combustion Engines
- EME5213 Mechanical Vibrations
- EME5223 Advanced Mechanics of Materials
- EME5253 Engineering Analysis I
- EME6813 Integrated Mechanical Design*

*Required for non-thesis option only

Applicants can choose elective courses and receive a concentration in one of the four following fields: Thermal/Fluid Systems, Structural Systems, Manufacturing, and Automotive. Thesis option students can obtain a concentration if they take two courses from one of the above areas and do their thesis in that same field. Non-thesis option students can obtain a concentration if they take four courses in one of the above areas. Students can receive only one concentration.

Thermal/Fluid Systems
- EME5153 Applied Thermodynamics
- EME6223 Conduction Heat Transfer
- EME6233 Convection Heat Transfer
- EME6373 Powertrain Systems 1
- EME6413 Advanced Thermodynamics
- EME6443 Emissions and Control Systems
- EME6523 Combustion and Emissions
- EME6543 Computational Fluid Dynamics

Structural Systems
- EME5243 Finite Element Analysis II
- EME6113 Fatigue Analysis
- EME6123 Automotive Structural Analysis
- EME6213 Fundamentals of Acoustics
- EME6383 Powertrain Systems 2
- EME6423 Advanced Dynamics
- EME6433 Advanced Vehicle Dynamics
- EME6533 Mechanical Vibrations II

Manufacturing
- EME5123 Optimization of Manufacturing Systems
- EME6103 Engineering Materials
- EME6203 Manufacturing Processes
- EME6303 Computer Integrated Manufacturing
- EME6323 Expert Systems in Manufacturing
- EME6403 Quality Control
- EME6703 Manufacturing Systems
M. S. M. E. ADMISSION

Admission to the M. S. M. E. program as a regular graduate student requires the applicant to:
1. Hold a BSME degree from an ABET-accredited university;
2. Provide official transcripts of all completed college work;
3. Have earned an overall GPA of at least 3.0 on a 4.0 scale;
4. Submit a graduate application form; and
5. Submit two letters of recommendation, including one from a professor in the student’s undergraduate program and one from a corporate supervisor.

Applicants who do not meet all conditions for regular admissions may be admitted on a provisional basis as determined by the MSME Graduate Admissions Committee. The applicant will be evaluated for official graduate student status upon completion of nine (9) semester hours of graduate coursework, achieving a minimum grade of 3.00 in each course, at the university.

Applicants with an engineering baccalaureate degree in a field other than mechanical engineering who have a GPA of at least 3.00 may be admitted on a provisional basis. These students must satisfy all prerequisite requirements before they can be granted official graduate status. All course work must be completed within five years after the program is started.

M. S. M. E. TRANSFER PROCEDURE

For applicants transferring from other graduate programs into the M. S. M. E. program, no more than six (6) graduate semester credit hours may be transferred, and these must be from an accredited M. S. M. E. program. Any exceptions to this policy must be approved by the MSME Graduate Admissions Committee. A minimum grade of 3.00 must have been achieved in all transfer courses. Credit for courses taken in a graduate program other than mechanical engineering will be reviewed to determine whether they may be substituted within the M.S.M.E. program. A request for transfer courses to be considered must be made in writing at the time of application to the M.S.M.E. program and must be accompanied by transcripts, course descriptions, and syllabi for each proposed transfer course. For some transfer courses, the MSME Graduate Admissions Committee may require the applicant to demonstrate proficiency in the subject through interviews with faculty members who have expertise in the subject.

CERTIFICATE IN MANUFACTURING SYSTEMS

Lawrence Technological University’s Certificate in Manufacturing Systems (C.M.S.) is offered in response to a need that exists in small and medium size manufacturing enterprises (SME). Topics include:
1. The different manufacturing processes as well as the capabilities and limitations of these processes;
2. The variety of manufacturing systems and how well they are suited for flexibility and productivity;
3. The importance of computers in the manufacturing systems and how well they are suited for flexibility and productivity;
4. The global competitiveness and the need to productively manufacture products; and
5. Effective leadership and management.

ADMISSION REQUIREMENTS FOR THE C. M. S.

Admission into the Certificate in Manufacturing Systems requires:
1. Bachelor’s degree in engineering, management, physics, computer science, chemistry or mathematics.
2. Two letters of recommendation from supervisors.
3. A resume including professional experiences and extracurricular activities.

REQUIREMENTS FOR THE C. M. S.

EME6203 Manufacturing Processes
EME6303 Computer Integrated Manufacturing
EME6503 Manufacturing Productivity
EME6703 Manufacturing Systems
MGT6013 Leadership and Management

A Certificate in Manufacturing Systems will be awarded upon the successful completion of the above five courses.
ECE5113 SUSTAINABLE CONSTRUCTION PRACTICES
Prerequisite: Graduate standing or permission of graduate advisor. Coverage of construction methods and techniques that employ the principles of sustainable development. Materials and methods of construction, infrastructure planning and development, and environmental implications of construction activities. Lect. 3 hrs. 3 hours credit

ECE5213 PROJECT MANAGEMENT TECHNIQUES
Prerequisite: Graduate standing or permission of graduate advisor. The wide range of management techniques in civil infrastructure projects. Focus on construction scheduling, budgeting, cash flow, and quality management. Current software is used throughout the course. Actual civil infrastructure projects used include highway, airport, water and wastewater facilities. Lect. 3 hrs. 3 hours credit

ECE5223 TECHNIQUES OF PROJECT PLANNING AND CONTROL
Prerequisite: Graduate standing or permission of graduate advisor. Project planning and control systems at the firm and project level. Topics: planning and scheduling techniques, including CPM, PERT, LOB; resource allocation; project control; supply chain models; treatment of uncertainty; and electronic integration of time and cost planning and control. Lect. 3 hrs. 3 hours credit

ECE5233 ADVANCED CONSTRUCTION TECHNIQUES AND METHODS
Prerequisite: Graduate standing or permission of graduate advisor. An in-depth evaluation of current and emerging construction techniques and methods that are designed to improve the constructability, performance and lifecycle costs of civil infrastructure projects. New materials, design approaches and construction techniques are investigated by examination of specific experiences in the construction industry. Lect. 3 hrs. 3 hours credit

ECE5243 FUNDAMENTALS OF CONSTRUCTION ACCOUNTING AND FINANCE
Prerequisite: Graduate standing or permission of graduate advisor. Concepts and fundamentals of financial accounting and economics in general, and specifically in the construction industry. Financial statement understanding and analysis, accounting concepts, project accounting methods, and the nature of project costs. Case study of major construction contractor. Ownership structure, working capital, and the sources and uses of funds. Lect. 3 hrs. 3 hours credit

ECE5253 RISK MANAGEMENT AND PERSONNEL
Prerequisite: Graduate standing or permission of graduate advisor. The many risks and liabilities associated with construction, including safety and insurance issues. A detailed analysis of the human factor in construction, including allocation and utilization of personnel, recruitment and training. Labor relations and related contractual issues. Lect. 3 hrs. 3 hours credit

ECE5261 INTERNATIONAL CONSTRUCTION
Prerequisite: Graduate standing or permission of graduate advisor. Prepares construction professionals for international projects, exploring the differences in: construction systems, technology, management, and culture between advanced industrial countries (AIC), newly industrialized countries (NIC), and less developed countries (LDC); privatization of infrastructure, economic drivers of construction projects, risks, and risk management. Lect. 3 hrs. 3 hours credit

ECE5273 CONSTRUCTION LAW
Prerequisite: Graduate standing or permission of graduate advisor. Bid errors, contract disputes, and payment issues. Engineer, architect, and construction manager professional liability will be reviewed. Health and safety law, environmental liability, and administrative law. Lect. 3 hrs. 3 hours credit

ECE5283 ADVANCED COST ESTIMATING
Prerequisite: Graduate standing or permission of graduate advisor. Advanced procedures and methods to prepare quantity measurements, estimate labor and equipment productivities, obtain material costs, and develop comprehensive cost estimates for construction. Cost estimating at conceptual, schematic, detailed, and bid stages, measurement and pricing of work; and work breakdown structures. Lect. 3 hrs. 3 hours credit

ECE5293 SPECIAL TOPICS IN CONSTRUCTION ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Topics of current interest in the field of construction engineering. Course content subject to change each time the course is offered. Lect. 3 hrs. 3 hours credit

ECE5326 INTERNATIONAL CONSTRUCTION
Prerequisite: Graduate standing or permission of graduate advisor. Prepares construction professionals for international projects, exploring the differences in: construction systems, technology, management, and culture between advanced industrial countries (AIC), newly industrialized countries (NIC), and less developed countries (LDC); privatization of infrastructure, economic drivers of construction projects, risks, and risk management. Lect. 3 hrs. 3 hours credit

ECE5333 AIR POLLUTION CONTROL
Prerequisite: Graduate standing or permission of graduate advisor. Methods of source testing and monitoring. Control of air pollution by process modification and various air pollution control methods. Design techniques coupled with air dispersion modeling and their relative effectiveness. Lect. 3 hrs. 3 hours credit

ECE5343 ADVANCED ENVIRONMENTAL ENGINEERING
Prerequisite: ECE4343 or equivalent; Graduate standing or permission of graduate advisor. Recent advances in the design of unit operations in water and wastewater treatment plants. New developments in natural systems for waste management and treatment practices. Microcomputer applications. Lect. 3 hrs. 3 hours credit

ECE5353 ENVIRONMENTAL MANAGEMENT
Prerequisite: Graduate standing or permission of graduate advisor. Designing and implementing environmental regulations and impact assessment programs. Techniques used in environmental impact assessment and regulation. Methods of analysis and the process of environmental planning and management. Lect. 3 hrs. 3 hours credit

ECE5363 SURFACE WATER QUALITY MANAGEMENT
Prerequisite: ECE4343 or equivalent; Graduate standing or permission of graduate advisor. Management models in the cause-effect analysis of water quality in surface water bodies such as lakes, estuaries, bays, harbors, streams and rivers. Waste load allocation management strategies to reduce waste inputs to surface water bodies. Water quality modeling and control in the transport and fate analysis of contaminants in surface water. Lect. 3 hrs. 3 hours credit
ECE5393 SPECIAL TOPICS IN ENVIRONMENTAL ENGINEERING
Prerequisite: Senior standing or permission of graduate advisor. Material of a specialized nature that is of interest to faculty and students. Lect. 3 hrs. 3 hours credit

ECE5423 GEOENVIRONMENTAL ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Waste containment facilities design, construction and operation; including linear systems and geosynthetics, interaction of soil with chemicals, and transport of chemicals and water in soils. Lect. 3 hrs. 3 hours credit

ECE5433 GROUND IMPROVEMENT METHODS FOR FOUNDATIONS
Prerequisites: ECE3424; Graduate standing or permission of graduate advisor. Practical and innovative design methods for ground improvement related to soft ground, deep foundations, slope stability, seismic activity, and geosynthetics. Combines investigation of case histories, current projects, design methodology, and geotechnical engineering theory. Lect. 3 hrs. 3 hours credit

ECE5453 PRACTICUM IN GEOTECHNICAL ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Design-intensive investigation of current practices and applications in geotechnical engineering. Existing field projects are incorporated into the class activities. Lect. 3 hrs. 3 hours credit

ECE5463 EARTHQUAKE ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Geotechnical considerations of earthquake engineering and foundation vibrations. Stress-strain behavior of soils under dynamic loading; seismicity; liquefaction; soil-structure interaction; foundation vibrations. Lect. 3 hrs. 3 hours credit

ECE5473 EARTH RETAINING STRUCTURES
Prerequisite: Graduate standing or permission of graduate advisor. Analysis and design of retaining walls, braced cuts, tie back cuts, and mechanically stabilized earth. Lateral earth pressure due to soil, water, surcharge, and other effects; local and overall stability; and the design of earth retaining systems. Lect. 3 hrs. 3 hours credit

ECE5493 SPECIAL TOPICS IN GEOTECHNICAL ENGINEERING
Prerequisite: Senior standing or permission of graduate advisor. Material of a specialized nature that is of interest to faculty and students. Lect. 3 hrs. 3 hours credit

ECE5523 RIVER ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. An investigation into multi-purpose river usage. Sediment erosion, transportation and deposition in rivers and reservoirs. Channel modification practices and impacts. Hydraulic design of river structures. River restoration techniques. Computer modeling. Possible field trips. Lect. 3 hrs. 3 hours credit

ECE5533 COASTAL ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Basic coastal engineering knowledge is preferred, but not a prerequisite. See instructor if you have not taken a coastal engineering course. Lect. 3 hrs. 3 hours credit

ECE5553 PORTS AND HARBORS
Prerequisite: Graduate standing or permission of graduate advisor. Design procedures behind ports and harbors ranging from private small craft harbors to large commercial ports. Hydrodynamic concerns and construction aspects such as breakwater design, berthing layout, and dredging. Basic coastal engineering knowledge is preferred, but not a prerequisite. See instructor if you have not taken a coastal engineering course. Lect. 3 hrs. 3 hours credit

ECE5593 SPECIAL TOPICS IN HYDRAULIC ENGINEERING
Prerequisite: Senior standing or permission of graduate advisor. Material of a specialized nature that is of interest to faculty and students. Lect. 3 hrs. 3 hours credit

ECE5713 ANALYSIS AND DESIGN OF PRESTRESSED CONCRETE
Prerequisite: ECE4743 or equivalent; Graduate standing or permission of graduate advisor. Use of prestressed concrete in infrastructure applications: pre-stressing principles, analysis and design of pre- and post-tensioned systems, losses, flexure, shear, bond, camber and deflection, continuous prestressing, columns, and circular prestressing. Use of advanced composite materials such as prestressing strands to solve infrastructure problems. ACI and PCI prestressed concrete design manual discussed. Lect. 3 hrs. 3 hours credit

ECE5543 URBAN HYDRAULICS
Prerequisite: Graduate standing or permission of graduate advisor. Theory, planning, analysis, and design of hydraulic structures in urban areas such as pipe networks, impoundments, spillways, culverts, etc. Computer modeling. Lect. 3 hrs. 3 hours credit
ECE5733 FINITE ELEMENT ANALYSIS FOR STRUCTURAL ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Advanced analysis of truss and framed structures, and also of continuous structures like shear walls and dams. The finite element method for analyzing structures. Issues of symmetry in structures, structural dynamics and thermal stress. Lect. 3 hrs.
3 hours credit

ECE5743 INTRODUCTION TO STRUCTURAL DYNAMICS
Prerequisite: ECE4733 or equivalent; Graduate standing or permission of graduate advisor. Practical analysis and design of real structures; basic theory and numerical analysis of one- and two-degree elastic systems, lumped-mass multi-degree systems; distributed mass and load, approximate design approach, earthquake analysis, and earthquake design. Lect. 3 hrs.
3 hours credit

ECE5753 ADVANCED CONCRETE DESIGN
Prerequisite: Graduate standing or permission of graduate advisor. Advanced concepts of reinforced concrete design. Design methods presented for structural components including flat slabs, waffle slabs, and foundations. Also, advanced concepts related to design for torsion and buckling are covered. Lect. 3 hrs.
3 hours credit

ECE5763 ADVANCED COMPOSITE MATERIALS AND THEIR USES IN STRUCTURES
Prerequisite: ECE3723 or equivalent; Graduate standing or permission of graduate advisor. Definitions, mechanical properties and durability of advanced composite materials. Protruded sections and fiber reinforced plastic (FRP) bars. Concrete structures reinforced and/or prestressed with FRP bars; behavior and strength in bending and shear. Repairs and rehabilitation of structures. New applications and design concepts. Lect. 3 hrs.
3 hours credit

ECE5793 SPECIAL TOPICS IN STRUCTURAL ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. A unified presentation of the entire field of structural analysis, including introduction to the analysis of indeterminate structures, force method analysis and applications, displacement method analysis and applications, analysis of shear walls, plastic analysis of continuous beams and frames, and concrete, steel and wood design topics. Lect. 3 hrs.
3 hours credit

ECE5923 SPECIAL TOPICS IN CIVIL ENGINEERING
Prerequisite: Graduate standing or permission of graduate advisor. Topic or topics of current interest in the field of civil engineering. Course content subject to change each time the course is offered. Lect. 3 hrs.
3 hours credit

ECE5993 SPECIAL TOPICS
Prerequisite: ECE5923 or equivalent; Graduate standing or permission of graduate advisor. In-depth study of particular civil engineering topic. An individual presentation is also required. Normally required for three semesters. Sem. 1 hr.
1 hour credit

ECE6123 INFRASTRUCTURE PROBLEMS AND SOLUTIONS
Prerequisite: Graduate standing or permission of graduate advisor. A systems approach to the understanding and solution of infrastructure problems and their solutions, the study of failures and their avoidance, quality in the constructed product, the maintenance of the infrastructure, and sustainable development. Lect. 3 hrs.
3 hours credit

ECE6143 INFRASTRUCTURE SYSTEMS
Prerequisite: Graduate standing or permission of graduate advisor. Applied engineering economic decisions, infrastructure financing, the permit process, legal considerations and management techniques. Lect. 3 hrs.
3 hours credit

ECE6163 INFRASTRUCTURE COST AND MANAGEMENT
Prerequisite: Graduate standing or permission of graduate advisor. Application of operations research techniques, particularly as they apply to the infrastructure. Lect. 3 hrs.
3 hours credit

ECE6073 THESIS 1
Prerequisite: Graduate standing. Initiation of a graduate thesis based on applied research. Normally available only with an approved and funded project. 3 hours credit

ECE6083 THESIS 2
Prerequisite: ECE6073. Completion of thesis. Normally available only with an approved project. 3 hours credit
EEE5114 ENGINEERING ANALYSIS
Prerequisite: Graduate standing or permission of department chair.

EEE5144 POWER DISTRIBUTION SYSTEMS
Prerequisite: Graduate standing or permission of department chair.
A.C. power, three-phase systems, per-unit analysis, one-line diagrams. Transformers, synchronous machines, salient pole machines, transient effects. Transmission line inductance, transmission line capacitance, transmission line models. The admittance model, the impedance model, the load-flow problem. Lect. 4 hrs. 4 hours credit.

EEE5204 ADVANCED COMPUTER ARCHITECTURE
Prerequisite: Graduate standing or permission of department chair.
Studies of contemporary computer organizations covering early systems, CPU design, instruction sets, control, processors, busses, ALU, memory, I/O interfaces, connection networks, virtual memory, pipelined computers, multiprocessors, and case studies. Lect. 4 hrs. 4 hours credit.

EEE5264 ADVANCED MICROPROCESSORS
Prerequisite: Graduate standing or permission of department chair.
Design and applications microcomputers. Topics include: 16 bit versus 32 bit processor organization, controller design, I/O port interfacing, memory structure, addressing methods, keyboard and display interface, and hardware arithmetic functions. Design and interface considerations for peripheral and interrupt devices. Lect. 4 hrs. 4 hours credit.

EEE5274 DIGITAL IMAGE PROCESSING
Prerequisite: Graduate standing or permission of department chair.
Image representation, image enhancement and restoration, image encoding, feature extraction, and image interpretation. Image compression. Applications to HDTV Computer Vision and Object Recognition design. Lect. 4 hrs. 4 hours credit.

EEE5284 PARALLEL ARCHITECTURES
Prerequisite: Graduate standing or permission of department chair.
In depth study of the design, engineering, and evaluation of modern parallel computers. Fundamental design: naming, synchronization, latency, and bandwidth. Architectural evolution and technological driving forces. Parallel programming models and communication primitives. Lect. 4 hrs. 4 hours credit.

EEE5324 NETWORK SYNTHESIS
Prerequisite: Graduate standing or permission of department chair.
Active and passive filter design, network functions, filters, normalization, magnitude approximation, phase approximation, time-domain considerations, sensitivity. Properties and synthesis of LC driving point functions, properties of transfer functions, synthesis of transfer functions. Single amplifier filters, op-amp parasitics, state-variable filters, universal active filter, bi-quadratic filters, active networks for direct realization, switched capacitor filters. Lect. 4 hrs. 4 hours credit.

EEE5354 ANALOG INTEGRATED CIRCUIT DESIGN
Prerequisite: Graduate standing or permission of department chair.

EEE5364 COMPUTER NETWORKING
Prerequisite: Graduate standing or permission of department chair.
Advanced treatment of the following: Local asynchronous communication; extending LANS-modems, repeaters, bridges; switches; packet switches; service paradigms; protocols and layering; binding protocol address; network management software; network security-filtering and firewalls. Lect. 4 hrs. 4 hours credit.

EEE5444 DIGITAL COMMUNICATIONS
Prerequisite: Graduate standing or permission of department chair.
Design of baseband and passband digital communication systems. Modulation techniques including PAM, QAM, FSK, FSK, and spread spectrum. Optimal demodulation techniques and their performance. Analysis, evaluation and design of integrated circuits for communication applications. Lect. 4 hrs. 4 hours credit.

EEE5524 MODERN CONTROL SYSTEMS
Prerequisite: Graduate standing.
State space realization of transfer functions, canonical forms, fundamental and state transition matrices, introduction to optimal control, quadratic performance indices, observers, Lyapunov stability theory. Lect. 4 hrs. 4 hours credit.

EEE5534 DIGITAL CONTROL SYSTEMS
Prerequisite: Graduate standing or permission of department chair.
Discrete time mathematics, Z-transforms, sampling rates, zero and first-order hold, time delays, system stability, continuous and discrete time systems, interfacing, computer control implementation concepts, state space realization. Lect. 4 hrs. 4 hours credit.
EEE554 APPLICATIONS OF ARTIFICIAL INTELLIGENCE
Prerequisite: Graduate standing or permission of department chair. System design using AI methods; AI programming languages, intelligent vision and imaging systems, data base search methods, logic and deduction using predicate calculus. Expert system design with applications to robots. Lect. 4 hrs. 4 hours credit

EEE5624 VLSI SYSTEMS DESIGN
Prerequisite: Graduate standing or permission of department chair. Analysis and design of MOS and bipolar integrated circuits. Fabrication processes, device characteristics, digital circuits for logic and memory functions. Semi-custom and full custom design application. Specific integrated-circuit design, design rules, and case studies. Lect. 4 hrs. 4 hours credit

EEE5634 OPTICAL SYSTEMS ENGINEERING
Prerequisite: Graduate standing or permission of department chair. Maxwell’s equations, geometrical and physical optics, optical components. Gaussian beams. Fourier transforming properties of lenses. Properties of lasers, LEDs, and detectors. Design of emitter and detector circuits. Design of free space and optical fiber systems. Lect. 4 hrs. 4 hours credit

EEE5654 DIGITAL SIGNAL PROCESSING
Prerequisite: Graduate standing or permission of department chair. Sampling theory and sampling hardware. Z transform. Architecture of VLSI digital signal processors. Design and implementation of real time polynomial, FIR, IIR, and adaptive filters. Spectral analysis with FFT. Design of DSP application in communication and digital control. Lect. 4 hrs. 4 hours credit

EEE5784 COMMUNICATION CIRCUITS
Prerequisite: Graduate standing or permission of department chair. Transmitters and receivers. Small-signal, high-frequency, and power amplifiers. Network noise and distortion. Hybrid and transmission-line transformers. Oscillators. Phase-locked loops. Modulators and demodulators. Lect. 4 hrs. 4 hours credit

EEE5911-4 DIRECTED STUDY
Prerequisite: Graduate standing or permission of department chair. In-depth study of an Electrical or Computer Engineering topic with written report to the course faculty advisor. 1-4 hours credit

EEE6314 COMPUTER VISION

EEE6524 NONLINEAR AND OPTIMAL CONTROL
Prerequisite: EEE5524 or EEE5534. Nonlinearity analysis with second order systems by phase plane, Lyapunov stability criteria, describing functions, feedback linearization, performance measures in optimal control, dynamic programming, Hamilton-Jacobi-Bellman equations, calculus of variations, minimization principles, numerical techniques. Lect. 4 hrs. 4 hours credit

EEE6690-4 MASTER’S PROJECT
Prerequisite: EEE5114, EEE5324, EEE5444, and EEE5534. The student designs or analyzes an electronic, electrical, or computer system and reports the results to his/her Committee via a written report and an oral defense. 1-4 hours credit
EME413 INTRODUCTION TO THERMAL SYSTEMS (non-ME)
Prerequisite: MCS2423, PHY2423, not open to mechanical engineering majors. Designed for non-mechanical engineering students to expose them to the principles of engineering thermodynamics, fluid mechanics, and heat transfer. Topics include the conversion of mass and energy, brief topical coverage of the second law of thermodynamics, thermodynamic cycles, hydraulics, flow losses, coefficients of drag, and heat exchangers. Lect. 3 hrs. 3 hours credit

EME5103 FASTENERS AND BOLTED JOINTS
Prerequisite: Senior or graduate standing. The selection and design of fasteners for the variety of applications joining various materials and components to assure proper retention and durability under environmental conditions, and assuring the ability to achieve the required levels in industrial and manufacturing operations. Lect. 3 hrs. 3 hours credit

EME5113 POLYMER MATERIALS AND PROCESSES
Prerequisite: Senior or graduate standing. Behavior, processing and applications of plastics; how fundamental characteristics of polymers influence the properties of plastics. Emphasis on the design and manufacture of plastic parts. Lect. 3 hrs. 3 hours credit

EME5123 OPTIMIZATION OF MANUFACTURING SYSTEMS
Prerequisite: EME3023. An emphasis of the principles necessary to apply modern system optimization techniques to manufacturing applications. Classical, modern mathematical, and Artificial Intelligence methodologies discussed. Lect. 3 hrs. 3 hours credit

EME5133 ADVANCED FLUID MECHANICS
Prerequisite: EME3024, senior or graduate standing. Compressible flow; shock waves; duct flow with friction and heat transfer; propulsion; turbo machinery; flow measurements; design project and review. Lect. 3 hrs. 3 hours credit

EME5203 DESIGN OF MECHANICAL JOINTS
Prerequisite: EME4003, senior or graduate standing. This course complements the course Fastening and Bolting, EME5013, which addresses the threaded fastener joint. Highlights, in a unified and comprehensive manner, the practical aspects and design methodology applicable to typical joints in industry held in place by rivets, bolts, weld seams or adhesive materials, among others. Gathers together and coordinates various topics that are typically treated as separate studies in numerous texts and publications. The design and performance of mechanical and structural joints and interfaces is reviewed and analyzed. Emphasizes practical results and formulas intended for the preliminary design of joints. Includes description and analysis of mechanical joints, threaded fastener joints, riveted joints, welded joints and adhesive joints. Also discussed are flanges and stiffeners; coupling and pin connections; and the design of hub and tubular joints. Lect. 3 hrs. 3 hours credit

EME 5143 INTERNAL COMBUSTION ENGINES
Prerequisite: EGE3003, senior or graduate standing. Methods of predicting engine performance; e.g. power, torque, efficiency and fuel consumption. Fuels, air and fuel induction systems, spark and valve timing and matching the engine to the vehicle. Experimental measurement procedures. Lect. 3 hrs. 3 hours credit

EME5153 APPLIED THERMODYNAMICS
Prerequisite: EGE3003, senior or graduate standing. The concept of availability, refrigeration cycles, mixtures and psychrometrics, combustion and thermochemistry, chemical equilibrium, equations of state and thermodynamic relations. Lect. 3 hrs. 3 hours credit

EME5213 MECHANICAL VIBRATIONS
Prerequisite: EME3043, senior or graduate standing. Free and forced vibration of one and two degree of freedom linear systems. Damped vibration. Concept of vibration isolation. Multi-degree of freedom systems. Lect. 3 hrs. 3 hours credit

EME5223 ADVANCED MECHANICS OF MATERIALS
Prerequisite: EME3013, senior or graduate standing. Advanced topics in classical strength of materials and analysis and design of mechanical components. Theories of failure, elasticity, thick-walled cylinders and rotating discs, plate bending, and thin shells. Lect. 3 hrs. 3 hours credit

EME5243 FINITE ELEMENT ANALYSIS II
Prerequisite: EME4243, senior or graduate standing. A second course in FEA that introduces higher order elements and focuses on using existing software packages to do class projects. Linear strain triangle, axisymmetric solid elements. Isoparametric formulation, dynamic analysis. Lect 2 hrs. 3 hours credit

EME5253 ENGINEERING ANALYSIS I
Prerequisites: MCS3413 and graduate standing. Designed to explore topics needed to enhance analytical skills of engineers for obtaining deeper understanding of scientific principles. Topics include vectors and vector spaces, matrices and system of linear equations, Eigenvalues and Eigenvectors, solution of ordinary differential equations, Laplace transforms, Fourier series, Fourier integrals and Fourier transforms, Vector Calculus and numerical methods. Lect. 3 hrs. 3 hours credit
EME6103 ENGINEERING MATERIALS
Prerequisite: Graduate standing. An advanced course in engineering materials including metals, ceramics, plastics, and composites. Thermodynamics of materials, phase transformations, solidification, plastic deformation, strengthening mechanisms, fracture, fatigue, and embrittlement. Case studies in engineering materials selection for manufacturing fabrication. Lect. 3 hrs. 3 hours credit

EME6113 FATIGUE ANALYSIS
Prerequisite: EME6223 and graduate standing. The design of mechanical and automotive components against fatigue failure. Mechanical properties and behavior of engineering materials subjected to static, dynamic, creep, and fatigue loads under environmental and stress traits typical of service conditions: biaxial theories of failure; behavior of crack bodies, microstructure-property relationships; design methodologies for homogeneous and composite materials. Elementary stress analysis, principal stress in 3D; Mohr’s circle, elastic deformation; Hooke’s Law, mechanism and rheological modeling, plastic, creep, and anelastic strain in metals and polymers, failure theories for ductile and brittle materials, application of failure theories, introduction to Linear Elastic Fracture Mechanics (LEFM) fatigue stress raisers, S-N curve & design, strain based fatigue analysis, application of LEFM to fatigue, fatigue crack growth behavior, fatigue design using LEFM, creep life estimates, stress-strain time relations. Lect. 3 hrs. 3 hours credit

EME6123 AUTOMOTIVE STRUCTURAL ANALYSIS
Prerequisite: EME5213, EME5223 and graduate standing. The concepts and applications of advanced mechanics of materials to the analysis and design of automotive structures. Basic body structure, loadings, and vehicle dynamics. Analytical techniques, including energy and numerical methods, especially those which lead to the application of modern design and the latest analysis tools. Body structures and configurations, primary vehicle motions and loadings, structural analysis techniques, modeling of automotive structures, modal and vibration analysis, fatigue and structural durability, use and integration of the latest engineering computational tools. Lect. 3 hrs. 3 hours credit

EME6133 HAZARDOUS MATERIALS MANAGEMENT
Prerequisite: Graduate standing. Receiving/usage/storage/disposal/transportation and recycling of hazardous materials, that are used in a variety of industries such as, automotive, steel, fabricating, construction, paint, manufacturing, plastic and petroleum. Effects of temperature and pressure changes on hazardous materials. New methods of waste minimization source control technology and quality assurance applications in handling the materials in accordance with Federal EPA laws and standards. Lec. 3 hrs. 3 hours credit

EME6203 MANUFACTURING PROCESSES

EME6213 FUNDAMENTALS OF ACOUSTICS
Prerequisite: EME5213 and graduate standing. Wave theory: vibrations and waves in strings and rods; reflection, transmission and excitation of plane waves; sound measurement; radiation from vibrating bodies; low-frequency sound transmission; ray acoustics; introduction to noise measurement and control. Lect. 3 hrs. 3 hours credit

EME6223 CONDUCTION HEAT TRANSFER
Prerequisite: EME4013 and graduate standing. Conduction heat transfer in steady and transient state, including heat sources. Analytical, numerical, graphical, and analog methods of solution for steady and fluctuating boundary conditions. Thermal stresses. Dynamics of thermal instrumentation and heat exchangers. Lect. 3 hrs. 3 hours credit

EME6233 CONVECTION HEAT TRANSFER
Prerequisite: EME4013 and graduate standing. Determination of the rate of heat transfer due to the transport of energy to or from surfaces by both molecular conduction processes and gross fluid movement inside channels and over external surfaces. Understanding of the convection heat transfer phenomena along with the mathematical techniques for the solution of such problems. Engineering applications. Lect. 3 hrs. 3 hours credit

EME6303 COMPUTER INTEGRATED MANUFACTURING
Prerequisite: Graduate standing. Computer-aided design/computer-aided manufacturing. Computerized manufacturing planning systems. Shop floor control and automatic identification techniques. Computer networks for manufacturing. The factory of the future. Lect. 3 hrs. 3 hours credit

EME6313 COMPUTER AIDED PROCESS PLANNING

EME6323 EXPERT SYSTEMS IN MANUFACTURING
Prerequisite: EME6303. Introduction to expert systems. Integration of expert systems into manufacturing. Knowledge of engineering in a manufacturing
EME6333 AUTOMOTIVE BODY AND CHASSIS SYSTEMS
Prerequisite: B.S.M.E. or graduate standing with approval of MSAE program director.
Introduction to body and chassis systems. Taught as a series of seminars presented by industry experts and coordinated by the MSAE program director. Includes body structures, safety design, design of hardware, dimensioning and tolerances, noise-vibration-harshness (NVH), seats and restraints, interior systems, electrical distribution. Standards and federal regulations, strategic product planning, and next generation vehicles are also included. Lect. 3 hrs. 3 hours credit

EME6343 AUTOMOTIVE MANUFACTURING
Prerequisite: B.S.M.E. or graduate standing with approval of MSAE program director. Metal forming and shaping processes, machining operations, assembly operations including major sub-assemblies, engine, transmission, stamping, body construction, paint systems, trim, electrical, powertrain, chassis. System optimization and quality improvement techniques including regression analysis, statistical process control, fundamentals of design of experiments, inventory control models, and statistical throughput models. Material handling, robotics, concurrent engineering, and total quality management. A plant tour of a vehicle assembly plant is arranged during the semester. Lect. 3 hrs. 3 hours credit

EME6353 AUTOMOTIVE MECHANICAL SYSTEMS
Prerequisite: B.S.M.E. or graduate standing with approval of MSAE program director. Basic mechanical systems of the automobile: axles; driveshfts; C.V. joint/half shafts; 4x4 driveline systems; steering columns; manual/power steering; brakes; suspension; heating, ventilating, and air conditioning (HVAC). Taught as a series of seminars presented by industry experts and coordinated by the MSAE program director. Includes hands-on introduction to the associated hardware. Lect. 3 hrs. 3 hours credit

EME6363 AUTOMOTIVE ELECTRICAL SYSTEMS
Prerequisite: B.S.E.E. or graduate standing with approval of MSAE program director. Basic electrical systems of the automobile: powertrain control, transmission control, charging and voltage regulation, storage, ignition, braking control (ABS), traction control, and electrical distribution with a hands-on introduction to associated hardware. Lect. 3 hrs. 3 hours credit

EME6373 POWERTRAIN SYSTEMS 1
Prerequisite: B.S.M.E. or graduate standing with approval of MSAE program director. Powertrain systems from a thermodynamic point-of-view. Thermodynamic analysis of the combustion and gas exchange processes in compression-ignition and spark-ignition engines, valve train design, ignition timing, mixture requirements, lubrication, vibration and balancing, emissions, engine control, and performance requirements. Lect. 3 hrs. 3 hours credit

EME6383 POWERTRAIN SYSTEMS 2
Prerequisite: B.S.M.E. or graduate standing with approval of MSAE program director. Introduces powertrain systems from a mechanical point-of-view: manual and automatic transmission systems, clutches, gears, flywheels, engine accessories, exhaust systems, powertrain control systems, powertrain matching, and vehicle performance systems. Taught as a series of seminars presented by industry experts and coordinated by the MSAE program director. A semester field trip to a transmission manufacturing/engineering facility is included. Lect. 3 hrs. 3 hours credit

EME6403 QUALITY CONTROL
Prerequisite: Graduate standing. Quality policies and objectives, management of quality, new product quality, production of quality. Statistical process quality control. Computers and SPC. Methods for process improvements, preventive maintenance. Quality measure and control in several manufacturing industries. Lect. 3 hrs. 3 hours credit

EME6413 ADVANCED THERMODYNAMICS
Prerequisite: EGE3003 and graduate standing. Postulational basis of thermodynamics; potentials and transformation theory; method of calculating properties from data. Introduction to statistical thermodynamics; calculation of properties of gases and plasmas; equilibrium mixture calculations. Lect. 3 hrs. 3 hours credit

EME6423 ADVANCED DYNAMICS
Prerequisite: EME3043 and graduate standing. Kinematics and kinetics of rigid bodies in space. Energy and momentum integrals. Equations of motion in general rotating coordinate frames. Euler angles, angular momentum, and kinetic of rigid bodies. Application to spatial motions of rigid bodies. Analytical mechanics. Lect. 3 hrs. 3 hours credit

EME6433 ADVANCED VEHICLE DYNAMICS
Prerequisite: B.S.M.E. or graduate standing with approval of MSAE program director. Study of vehicle dynamics with focus on loads, acceleration, braking, ride and handling, steering, tire dynamics, and vehicle instability (e.g., rollover). Lect. 3 hrs. 3 hours credit

EME6443 EMISSIONS AND CONTROL SYSTEMS
Prerequisite: EME6373. Further exploration and engineering consideration of the thermodynamic combustion processes of conventional internal combustion engines, the chemical products of the combustion process, and the engineering of the engine, control systems, and components to control vehicle emissions below the regulated levels. Lect. 3 hrs. 3 hours credit

EME6453 ADVANCED CAD/FEA ENGINEERING
Prerequisite: Graduate standing. Presentation and instruction in the use of computer aided design and finite element analysis for the engineering of automobiles to predict and control stress levels, vibration frequencies, deflections, etc., to reduce the need and reliance on physical mock-up and prototype development and testing. Lect. 3 hrs. 3 hours credit

EME6473 HYBRID ELECTRIC VEHICLES
Prerequisites: EME6373 and EME6333. The engineering requirements to optimize hybrid and alternative fuel vehicles to achieve satisfactory customer acceptance. Major vehicle considerations such as weight, aerodynamics, mechanical power losses, which in turn involve new materials, new manufacturing techniques, etc. Lect. 3 hrs. 3 hours credit
EME6503 MANUFACTURING PRODUCTIVITY
Prerequisite: Graduate standing. Productivity perspectives, productivity measurement, diversity of measurements. Causes of productivity declines, barriers to productivity, fostering technology transfer. Managing productivity by objectives. Requirements for successful productivity programs. Productivity improvement approaches. Strategy for designing, developing and implementing productivity management programs. Strategic planning for productivity management programs. Productivity improvement techniques. Setting up a formal productivity improvement program. Projects and case studies required. Lect. 3 hrs. 3 hours credit

EME6513 AUTOMOTIVE ADVANCED DRIVELINE SYSTEMS DESIGN I
Prerequisites: EME6353, EME6433. Mathematically grounded knowledge and engineering experience in design and testing vehicle driveline systems. Course one in a two course series. The course links vehicle dynamics and vehicle performance study with driveline systems design and develops analytical and design skills in automotive engineering. Analysis and synthesis of driveline systems layouts. Design of parallel algorithms for mechatronic driveline systems based on the optimization of vehicle operational properties, engineering design and experimental study of driveline subsystems and mechanisms. Lect. 2.5 hrs., Lab 1 hr. 3 hours credit

EME6523 COMBUSTION AND EMISSIONS
Prerequisite: EME5143 and graduate standing. Fundamentals of emission formation in combustion systems, wall quenching and imperfect combustion, unburned hydrocarbons, carbon monoxide, aldehydes, nitrogen oxides, species stratification in the combustion chamber, particulates. Effect of design parameters and engine operating variables on emission formation. Emission controls and instrumentation. Lect. 3 hrs. 3 hours credit

EME6533 MECHANICAL VIBRATIONS II
Prerequisite: EME5213 and graduate standing. Free and forced multidegree-of-freedom systems. Eigenvectors and eigenvalues and orthogonality of normal modes. Mode summation method. Lagrange’s Equations, solutions of forced vibration by Laplace Transforms and numerical methods. Rayleigh’s principle and approximate numerical techniques. Vibration of continuous systems: longitudinal and transverse vibration of beams; torsional vibrations, vibrating string. Lect. 3 hrs. 3 hours credit

EME6543 COMPUTATIONAL FLUID DYNAMICS
Prerequisite: EME3024 and graduate standing. Introduction to numerical techniques for the solution of inviscid and viscous compressible and incompressible flow and the use of existing algorithms and commercial software. Lect. 3 hrs. 3 hours credit

EME6563 ENTERPRISE PRODUCTIVITY
Prerequisite: Graduate standing. Productivity engineering and management, enterprise productivity planning, enterprise productivity measurement, total productivity management, the 10-step process for total productivity management, unique features of total productivity management, productivity improvement. Case studies. Lect. 3 hrs. 3 hours credit

EME6573 ADVANCED AUTOMOTIVE HVAC
Prerequisites: EME4013 or graduate standing with approval of MSAE program director. Introduction to the design and analysis of heating, ventilating, and air conditioning systems with an emphasis on automotive applications. Includes psychometrics, humidification, heating, cooling, fluid flow and pressure losses, and system design. Lect. 3 hrs. 3 hours credit

EME6603 ENGINEERING ECONOMICS
Prerequisite: Graduate standing. Monetary analysis providing methods of determining how to best invest a limited supply of money and time. Engineering cost analysis, financial analysis, depreciation and tax considerations, decision making under uncertainty, produce or buy, supplier cost evaluation, and new technology justification. Lect. 3 hrs. 3 hours credit

EME6703 MANUFACTURING SYSTEMS

EME6723 SPECIAL TOPICS IN ENGINEERING MANAGEMENT
Prerequisite: Graduate standing. Managing the engineering function, characteristics of engineering managers, and their decisions in engineering environment, effective planning of managing engineering functions, managing diversity in multicultural organization, operations management, project management, resources management, total quality management, quality management systems, time management and value management. Case studies. Lect. 3 hrs. 3 hours credit

EME6803 ENGINEERING MANAGEMENT
Prerequisite: Graduate standing. Leadership development for managing engineering, manufacturing, and service organizations. Planning and strategic management. Developing responsive organizations, managing human resources and a diverse workforce. Leadership, motivating for performance, managing teams, and communicating. Ethics and corporate responsibility. Managing technology and innovation, creating and managing change. New ventures and international management. Managerial control and decision making. Lect. 3 hrs. 3 hours credit

EME6813 INTEGRATED MECHANICAL DESIGN
Prerequisite: Graduate standing and approval of program director. A capstone course in the design and analysis of mechanical systems. Student work in teams to solve a thermal/fluid system, structural system, automotive, or manufacturing project. Written and oral presentations of the projects are required. Lect. 3 hrs. 3 hours credit
EME6901 PROFESSIONAL SEMINAR
Prerequisites: Graduate standing, EME6803. A forum for the integration of practicing engineers and faculty experiences in current manufacturing topics. Engineers give a formal presentation addressing a critical issue in manufacturing. (Must be taken twice.) Lect. 1 hr. 1 hour credit

EME6913 THESIS 1
Prerequisites: Graduate standing and approval of program director. First of a two course sequence required to fulfill the thesis option. Students work in collaboration with a faculty advisor and, optionally, an industrial advisor. Students are expected to meet regularly with their advisors. Upon completion of both courses, students make a verbal presentation of their findings and submit the thesis to a professional society for publication. Lect. 3 hrs. 3 hours credit

EME6993 GRADUATE DIRECTED STUDY
Prerequisite: Graduate standing and approval of program director. Students select a topic for in-depth study in one subject area. Students work in collaboration with a faculty advisor and, optionally, an industrial advisor and the program director. Students obtain faculty advisor and program director approval on the plan of work, meet regularly with the advisor, and submit report for approval of advisor and the program director. Lect. 3 hrs. 3 hours credit

EME703 DESIGN OF EXPERIMENTS
The planning of experiments. Factorial experiments. Fractional factorial experiments. Incomplete block designs. Modeling and optimization in manufacturing. Lect. 3 hrs. 3 hours credit

EME7203 MANUFACTURING SYSTEMS SIMULATION
Simulation analysis and decision making. Developing simulation models. Simulation languages for modeling. Data collection and analysis. Model verification and validation. Utilization of simulation models. Lect. 3 hrs. 3 hours credit

EME7303 DESIGN FOR RELIABILITY

EME7403 DESIGN FOR MANUFACTURING

EME7503 PROCESS CONTROL
Control objectives and benefits. Modeling for process control. Dynamic behavior of typical process systems. The feedback loop. Stability analysis. Digital implementation of process control. Multi-loop control effects and performance. Process control design and managing the design procedure. Control for product quality and profit. Lect. 3 hrs. 3 hours credit

EME7513 AUTOMOTIVE ADVANCED DRIVELINE SYSTEMS DESIGN II
Prerequisites: EME6513. Advanced knowledge, research, and engineering experience in automotive driveline systems. Theoretically grounded on applied mathematics and adaptive mechanics, it develops analytical skills in research, design, and experimental study of driveline systems. This is the second course in a two course series. General theory and engineering methods of analysis of driveline systems as multi-structural bodies dynamics. Noise and vibration of drivelines and related components. Interaction between drivelines, suspension systems, and vehicle bodies. Regular classes are accommodated with computer labs (ADAMS/Driveline) and experimental labs (NVH instrumentation). Lect. 2.5 hrs., Lab 1 hr. 3 hours credit

EME7603 STRATEGIC PLANNING

EME7613 TECHNOLOGY MANAGEMENT
Role of technology in creating wealth, critical factors in managing technology, the new paradigms for management of technology, technology life cycles, technological innovation, competitiveness, business strategy and technology strategy, technology planning, acquisition and exploitation of technology, technology transfer, how America manages technology. Lect. 3 hrs. 3 hours credit
DEGREE PROGRAMS OFFERED

Lawrence Tech’s College of Management offers these graduate programs:

- Master of Business Administration
- Master of Science in Industrial Operations
- Master of Science in Information Systems
- Career Integrated – Master of Business Administration
- Doctor of Business Administration
- Doctor of Management in Information Technology

Management is concerned with the planning, implementation, and monitoring activities undertaken by private- and public-sector organizations which serve society.

Lawrence Tech’s College of Management endeavors to (1) offer graduate students an appreciation of contemporary issues, challenges, and opportunities facing the management community; and (2) provide an in-depth understanding of the processes, systems, and operations of profit and not-for-profit organizations. In doing so, the graduate programs of the College of Management are designed to offer students the concepts, skills, and knowledge needed to function effectively in technical, administrative, and managerial positions including abilities which not only assist in securing employment but lead to steady progress within the organization.

It is the College’s goal to develop and enhance leadership capabilities in graduates while instilling in them the importance of education as a life-long process that leads to
professional achievement and personal satisfaction. The College recognizes that today’s manager faces challenges from strong and growing global economic forces, conflicting values, changing technology in products and processes, and demographic diversity among employees and customers. Therefore, the College is concerned with students’ intellectual and cultural growth as well as their educational progress in administrative fields of study.

Introduction—Lawrence Technological University’s College of Management has three primary operational objectives with respect to the information, knowledge, skills, and insights necessary to compete in contemporary organizations:
• to install and develop these skills/insight in graduate students;
• to demonstrate unique applications to managerial problem-solving issues and;
• to contribute to further theoretical/practical developments through applied research.

Foremost is the College of Management’s intent to provide a quality learning environment that is rooted in the tradition of teaching and scholarship based on relevant “real world” situations. More than ever, organizations find themselves operating in a highly competitive and ever-changing social, political, and economic/technological environment. Continued pressures on profit margins, fewer people responsible for maintaining work schedules, relentless global competition, and the pace of technological innovation are but four challenges facing many organizations today. Establishing long-term objectives and articulating innovative, highly targeted strategies for success are skills which every contemporary manager and leader must possess.

The Lawrence Tech College of Management’s graduate programs are designed to enable the student to develop and demonstrate proficiency in these personal and organizational strategies. The seminar-style format utilized at Lawrence Tech allows an open dialogue between the teaching professionals and the predominantly working student. Faculty understand the conflicting demands of balancing academic preparedness, family needs, and full-time employment. This understanding leads to the use of relevant case studies, simulations/class exercises, and guest speakers who can add a greater dimension of expertise to the course materials.

Perhaps the strongest competitive advantage of the Lawrence Tech graduate business programs are their singular focus on the melding of theory and practice. The graduate candidate need look no further than Lawrence Tech to find a highly motivated faculty discussing accounting, marketing, or management challenges with students who average 8 years of business experience and will accept nothing less than the best. In addition to the faculty’s continued commitment to excellence and their focus on real world situations, the graduating student survey gave high marks to small class sizes (leading to frequent student-faculty interaction) and unique approaches to problem-solving and team-building as primary reasons to seek a College of Management masters at Lawrence Tech.

The College of Management is accredited by the Association of Collegiate Business Schools and Programs (ACBSP) and the International Assembly of Collegiate Business Education (IACBE).

ADMISSION REQUIREMENTS

Unless indicated elsewhere, applicants to the College of Management graduate degree programs are expected to be either working or work experienced. Applicants must meet one of the following criteria:
A. Have earned a baccalaureate degree with a GPA of 3.00 or higher from regionally accredited institutions;
B. Have earned a baccalaureate degree and be satisfactorily endorsed by their employer because of their significant work experience;
C. Have earned a baccalaureate degree from a regionally accredited undergraduate program and present an acceptable GMAT score.
D. Have earned a master’s degree from a regionally accredited institution.

Accepted applicants may be required to satisfactorily complete courses fundamental to the graduate degree program they have selected.

Classifications of graduate students are: Unclassified, Special Student, and Probationary.

Special students are allowed to take up to 6 semester hours and are required to meet a certain performance level to remain in the program.

TRANSFER PROCEDURE TO THE NON-SPECIALTY PROGRAMS

A petition for transfer of credits should be initiated by the student in the form of a letter addressed to Dean, College of Management, and made prior to completion of the first semester of the graduate program. Twelve semester credits are the maximum accepted by Lawrence Tech’s College of Management for the M.B.A. program and nine semester credits for the other Master’s programs. These courses must be graduate-level courses taken at an accredited college/university. Each course generally must have been taken within seven years of application for admission. Transfer students should apply for admission through the Office of Admissions. A grade of 3.00 or better must have been earned — “passed/not passed,” “pass/fail,” or “pass/no entry” grades are not acceptable.

Students may be required to submit additional evidence (e.g., course syllabi, catalog descriptions and tests/examinations) in order to justify transfer of credits. The Management Graduate Admissions Committee may require the applicant to demonstrate proficiency in the subject either through an interview or written examination prepared by faculty members who have expertise in the subject/discipline.
MASTER OF BUSINESS ADMINISTRATION

Four fundamental goals dictate both the overall design of the Lawrence Tech Master of Business Administration curriculum; and the learning/teaching philosophy of the faculty:

1. to develop and demonstrate student competencies in innovative problem identification and solving, oral and written communications skills, team-building techniques, and establishing assessment and accountability within the organization; and
2. to provide learning experiences that prepare graduates for leadership positions;
3. to encourage a contemporary, cross disciplinary approach to developing and retaining people while managing and monitoring the multiple environments of the organization; and
4. to promote the intellectual curiosity, commitment, and integrity necessary to effectively address the needs of the business community.

These goals serve not only to direct the activities of Lawrence Tech’s professional teaching staff, but also to allow the greatest interaction between student and faculty.

M.B.A. Curriculum Design –

Lawrence Tech’s M.B.A. program is based on the philosophy that graduate level studies should incorporate both theoretical and empirical studies demonstrating a broad understanding of the skills/knowledge necessary to achieve personal and organizational success and growth. The inaugural course, Leadership and Management, is designed to provide opportunity for the student (both individually and in teams) to demonstrate a comprehension of real world problems and issues. Solutions requiring interpersonal skills and decision support systems are used to highlight contemporary organizational issues. Students should take Leadership and Management at the start of their program.

Pre-core courses may be required of students who have not taken undergraduate courses in business. Waivers from the pre-core courses are granted at the time of admission to the M.B.A. program. The essential foundations of accounting, finance, economics, management, marketing, legal environment, statistical and quantitative methods are covered in these courses. Pre-core classes may be taken concurrently with those core classes that require no prerequisites.

Core courses are designed to provide students with meaningful experiences in analyzing and implementing operational concepts and programs as well as leading directly to the selections of appropriate elective courses. Provided the prerequisites, if any, have been taken or waived, the student may select Human Resources Management, Operations Management, Management Information Systems, Ethics, Management Accounting, Financial Management, Marketing Management, or International Business. Finally, Strategic Management is considered the “capstone” course and should only be scheduled near the end of the student’s program. Elective concentrations are offered at Lawrence Tech in the areas of human resources, international business, information systems, operations management, project management, finance, and E-Commerce. The option to take a directed study from a qualified faculty member provides an opportunity to tailor an individual program to meet the particular needs of students and employers.

M.B.A. Graduation Requirements – Successful completion of the M.B.A. program requires:

• 12 courses consisting of one inaugural course, eight core courses, and three electives with at least eight courses taken at Lawrence Tech;
• completion (or waiver) of all pre-core courses;
• overall grade point average (GPA) of at least 3.00 in core/elective program areas; and
• completion of the above requirements within seven years of program entry.

MASTER OF SCIENCE IN INFORMATION SYSTEMS

M.S.I.S. Management Core –

Students take three courses: Foundations of Management introduces the non-business major to modern management practice. Management Information Systems introduces students to the use of computer system to solve business problems and improve business operations. Project Management focuses on the techniques and processes necessary to manage a major project. Students with suitable academic and/or professional experience may be waived from a course.

M.S.I.S. Technical Core –


M.S.I.S. Concentration –

Students select a concentration in IT Management or Technology track by taking three courses. The final course in the concentration is a capstone that summarizes and extends prior learning. Last, the student completes the program by taking the necessary electives (the number depends on the courses transferred or waived due to prior academic and/or work experience) to complete the 30 semester hours required for graduation.
M.S.I.S. Outcome Assessment – All students enrolled are required to sit for the core examination given by the Institute for the Certification of Computer Professionals (ICCP). Students must sit for this exam and submit their score to the College of Management. They need not pass the exam to graduate, however. Lawrence Tech uses this information for continuous improvement of the M.S.I.S. program.

M.S.I.S. Graduation Requirements – Successful completion of the M.S.I.S. program requires:

• 30 semester credits consisting of 15-21 hours of core courses, 9 hours in a concentration, and 0-6 hours of general electives with at least 21 credits taken at Lawrence Tech;
• completion or waiver of all pre-core courses;
• an overall grade point average (GPA) of at least 3.00 in core/elective program areas;
• sitting for the core of the ICCP exams; and
• completion of the above requirements within seven years of program entry.

M.S.I.S. Curriculum Design – The M.S.I.S. program requires completion of 30 semester credit hours. Pre-core courses may be required of students who are not proficient in math, statistics, or computers. The core courses are designed to increase the student’s expertise in technological/industrial operations. Provided the pre-core requirements have been completed or waived, the student may select Accounting for Decision Making, Management Science or Human Resources Management. Courses in which students already have a strong foundation may be waived and another class substituted. The remaining core course work includes Quality Control Techniques, Materials and Processes, and Facilities Management, Topics in Operations Management, and the “capstone” course, Cases in Operations Management. Lastly, the student may take elective course work from any Lawrence Tech graduate level program.

M.S.I.O. Graduation Requirements – Successful completion of the M.S.I.O. program requires:

• an overall grade point average (GPA) of at least 3.00 in core/elective program areas; and
• completion of the above requirements within seven years of program entry.

CAREER INTEGRATED-EXECUTIVE MANAGEMENT MASTER OF BUSINESS ADMINISTRATION

Introduction – Successful leaders and managers in the 21st century need more than knowledge of business management. They must also possess an understanding of organizational behavior and how organizations interact with the society surrounding those organizations. They must cultivate those values and attitudes that enhance contributions and performance as a member of a team.

Lawrence Tech’s weekend M.B.A. program was a pioneer in management education and innovative classroom instruction. The Integrated M.B.A.
program aims at the development of the total person rather than just at the delivery of knowledge. Business subjects such as Leadership and Management, Human Resource Management, and Organizational Development are woven into a singular theme of business management. With the integrations of selected business subjects emphasizing team-oriented learning that links theory with practice, graduate students will acquire a broad understanding of the skills and knowledge necessary to achieve personal and organizational growth.

C.I.-M.B.A. Curriculum Design – This 36-credit hour weekend program consists of six modules leading to a Master of Business Administration degree. Graduate students move consecutively through the program and complete their degree requirements in two years. The team-taught classes are offered during three 13 week terms (Fall, Spring and Summer). Classes meet on alternating weekends, Friday evening and Saturday.

The core subjects are integrated into six modules of six credits each. During the final term, students will select an area of concentration (module 6). The program includes distance learning activities on off weekends.

Each learning module is built on a complex, unifying experience. In a simulated business environment, students encounter organizational issues, problems, and various assignments. What students are assigned to do in these learning modules is what managers would be expected to do as they meet their responsibilities to their organizations. Often, the students are expected to work in teams. The assignments are managerial in character and are not just academic exercises. The art of managing rather than management education is emphasized throughout the program.

The learning experience is based on complex cases that require students to assume the roles and responsibilities of organization leaders and managers. Faculty members and executives from industry serve as facilitators of managerial task performance, as instructors of foundational and functional materials, and as assessors of student competencies and development. The emphasis of the program is on the development of skills and behavior rather than on the exposure to specific academic material.

Program Structure:
Module 1 Foundations of Business
Module 2 Foundations of Management
Module 3 Business Management
Module 4 Production and Operations Management
Module 5 Strategic Planning
Module 6 Management Applications

C.I.-M.B.A. Graduation Requirements – Successful completion of the C.I.-M.B.A. requires:
• 6 modules of 6 credits each
• overall grade point average of at least 3.00

C.I.-M.B.A. ADMISSION

Applicants to the College of Management’s weekend Career Integrated M.B.A. program are expected to:
• Have earned a baccalaureate degree with a GPA of 3.00 or higher from a regionally accredited institution; or;
• Have earned a master’s degree from a regionally accredited institution, and be sponsored by their employer (may be waived for self-employed applicants);
• Have at least five years of work experience, preferably at a supervisory level;
• Successfully compete for one of the 25 seats available in the program.

Pre-core Courses
ACC5002 Financial Accounting
FIN5012 Economic Processes
FIN5022 Introduction to Finance
MGT5012 Statistical Methods
MGT5032 Legal Environment
MKT5012 Introduction to Marketing

Core Courses
MGT6013 Leadership and Management (Inaugural course)
ACC6013 or MGT6043 Management Accounting or Ethics in Business
FIN6013 Financial Management
HRM6023 Human Resources Management
MGT6053 Perspectives in International Business
MGT6063 Strategic Management
MIS6013 Management Information Systems
MKT6013 Marketing Management
OPM6033 Operations Management

Elective Courses
Global Business
MGT6123 International Marketing Management

Human Resources
HRM6113 Management and Organization Development
HRM6123 Performance and Productivity Improvement
HRM6133 Managing the Project Organization
HRM6143 Managing Multicultural Organizations
MASTER OF SCIENCE IN INFORMATION SYSTEMS (M.S.I.S.)

Total Semester Credit Hours, excluding pre-core: 30

Pre-core Courses

Personal Computer Proficiency
MIS5002 Introduction to Programming
MIS5012 Advanced Programming
MGT5012 Statistics
MGT6153 Foundations of Business

Management Core
MGT6173 Foundations of Management
MIS6013 Management Information Systems
MGT6153/ MIS6153 Project Management

Technical Core Courses
MIS6113 Database Models
MIS6123 Analysis and Design of Complex Systems
MIS6143 Telecommunications & Networking
MIS7413 Software Development I

Concentration Courses
(Choose Technical or IT Management)

Technical:
Two appropriate IT technical courses, approved by academic advisor.
MIS7493 Technical Capstone

IT Management:
Two appropriate MBA and/or IT courses, approved by academic advisor.
MIS7593 Managing Information Technology

All students must sit for core ICCP examination, MIS8000.

MASTER OF SCIENCE IN INDUSTRIAL OPERATIONS (M.S.I.O.) EVENING PROGRAM

Total Semester Credit Hours: 30

Pre-core Courses*

(Pre-core courses may be required if the student is not proficient in math, statistics and computer use, and waived if the student has prior acceptable coursework.)
MCS1003 Intro to Computers (or equivalent)
MCS1224 Intro to Math Analysis (or equivalent)
MGT5012 Statistical Methods

Core Courses
ACC5013 Accounting for Decision Making*
HRM6023 Human Resources Management
OPM6023 Management Science
OPM6033 Operations Management
OPM6123 Quality Control Techniques
OPM6133 Materials, Processes and Facilities Management
OPM6143 Cases in Operations Management
OPM7123 Topics in Operations Management

Elective Courses
COM6103 Managerial Communications
HRM6113 Management and Organizational Development
HRM6133 Managing the Project Organization
MGT6013 Leadership and Management
MGT6153 Project Management
OPM6113 Inventory Models
OPM6153 Entrepreneurship and Venture Management

Other Electives
OPM621X Directed Study or any other graduate course subject to approval by the dean's office

DOCTOR OF BUSINESS ADMINISTRATION

The Doctor of Business Administration (D.B.A.) degree at Lawrence Technological University is an intensive part-time program that is designed to strengthen leaders who can think strategically and act decisively in today's global business environment. Graduates are expected to have received the skills required to act decisively in meeting the needs of a rapidly changing society. The program also enhances students' abilities to further their careers as innovators in business. These skills are essential for successful business leaders as it becomes critical to employ leaders with a sense of social responsibility and integrity with ever increasing sophistication in every facet of organizational life.

As a practitioner-scholar program, Lawrence Tech's D.B.A. aims to provide thorough preparation in both the theory and practice of the latest strategic leadership and change management ideas. Graduates will have the preparation to excel in significant roles as leaders in the world's global work force. Graduates will also be provided with the breadth and depth of business administration disciplines required for success in university teaching.

D.B.A. CURRICULUM DESIGN

The curriculum consists of 36 hours of course work and 24 equivalent hours of research towards a doctoral dissertation, and can be completed within
D.B.A. ADMISSIONS

Admission to the program is competitive and the attainment of a specific set of minimum qualifications does not assure admission. Instead, admission is granted to the candidates deemed to be most qualified to achieve success. In general, applicants must:

• Hold a master’s degree or equivalent in business administration from an accredited college or university with a GPA of 3.3 or higher.

Students with an out-of-field master’s degree are required to complete the prerequisite Pre-Foundation Core and M.B.A. Foundation courses before starting the D.B.A. Program.

• Have accumulated five years of experience in an appropriate managerial position in a corporate, governmental or non-profit organization;

• Students whose native language is not English are required to take TOEFL or IELTS and TSE. Minimum acceptable score is 550 on the written TOEFL or 250 on the computerized version. Minimum acceptable IELTS is 7.0. TOEFL/IELTS requirement is waived for those international students who have completed their degrees at a recognized U.S. university. In addition, minimum acceptable TSE score is 74 percentile;

• Provide three appropriate letters of recommendation;

• Provide a statement of purpose indicating the applicant’s chief academic interest, strengths and limitations, reasons for selecting the D.B.A. program, and for choosing Lawrence Tech.

• Complete an interview (diagnostic evaluation) with the D.B.A. committee.

Students who have exceptional merit in one of the above criteria but do not meet all admission criteria may be admitted under special circumstances determined by the Admissions Committee.

Students who meet the admission requirements, but where supporting documentation (e.g. academic transcripts) is still pending, may be admitted conditionally.

Admitted students are required to take the GMAT and achieve an acceptable score.

D.B.A. FIELDS OF STUDY

Coursework in the D.B.A. Program is offered in the following three areas:

1. D.B.A. Core Course work:

a. Advanced Leadership Theory and Practice: Creating Strategic Change Leaders

b. Global Economic Theories: Trade and Systems

c. Institutions, Structures, and Systems

d. Global Marketing Strategy, Structures, and Systems

e. Financial Valuations and Strategies

f. Strategic Management Information Systems and Design

g. Organization Development & Transformation: Leading Organizational Change

h. Advanced Topics: Emerging Fields of Business

2. Research Methodology

a. Introduction to Inquiry and Research Methodology

b. Qualitative Research Techniques

c. Business Statistics

d. Business Modeling and Analytical Techniques

3. Business Major (dissertation)

a. Strategic Leadership and Organization Development

b. Business Economics and Finance

c. International Business, Trade, Finance, and Marketing

Students must complete work in all three fields of study: core, research, and major (dissertation). The business major (dissertation) should be one of the areas identified in item 3. above. A student must complete the core and research field and choose the business major with the assistance of the director of the D.B.A. program and/or Supervisory Committee Chair.

APPLICATION FOR ADMISSION

• Submit application containing the following items:
  – Completed application form
  – Professional resume
  – Statement of purpose
  – Official university-level transcripts
  – Three letters of recommendation
  – GMAT score
  – TOEFL score

• Attend a diagnostic evaluation interview

COURSE WORK

(36 credit hours)

– Complete 36 credit hours of course work, consisting of 24 credit hours of the D.B.A. core and 12 credit hours in research methods.

COMPREHENSIVE EXAMINATIONS

– Request and pass written comprehensive examinations in the D.B.A. core and research methods fields.

DISSERTATION

(24 credit hours)

– Register for the dissertation proposal course – 3 credit hours

– Submit and present the research proposal to the Supervisory Committee as part of the requirements for the course (application for candidacy)

– Register for dissertation credit hours toward completing the research component of the Program – 21 credit hours
• Perform research and write dissertation
• Apply for graduation
• Defend dissertation

D.B.A. COURSE WORK

The core coursework consists of 24 credits:

DBA8013 Advanced Leadership Theory and Practice
DBA8023 Global Economic Theories
DBA8033 Institutions, Structures, and Systems
DBA8043 Global Marketing Strategy
DBA8053 Financial Valuations and Strategies
DBA8063 Strategic Management Information Systems
DBA8073 Organization Development
DBA8083 Advanced Topics

The research course work consists of 12 hours of course work:

DBA7013 Introduction to Inquiry and Research
DBA7023 Qualitative Research Techniques
DBA7033 Business Statistics
DBA7043 Business Modeling and Analytical Techniques

D.B.A. COMPREHENSIVE EXAMS

A student must demonstrate competence in the major and research fields by the successful completion of written comprehensive examinations. All coursework in the field must have been completed before taking the comprehensive examination. A student is eligible for a written comprehensive examination, if he/she has completed:

1. Coursework in the major field
2. Coursework in the Research field.

D.B.A. DISSERTATION

Each D.B.A. candidate must complete a dissertation based on a dissertation proposal. The dissertation proposal must plan research work on an appropriate applied research topic with the rigor and sophistication expected of doctoral level work. The student must register for the Dissertation Proposal Course (3 cr. hrs). The proposal must be submitted for acceptance by a student’s dissertation committee. The research work should demonstrate innovation and applicability of state-of-the-art principles in the chosen field to real-world problems of present and future interest, i.e. relevance to commerce and industry. Where feasible the Dissertation Committee consists of the members of the Supervisory Committee and one external member, preferably from an organization where the research can be applied.

D.B.A. RESIDENCY REQUIREMENTS

General residency requirements for students enrolled in the D.B.A. program include:

1. Registration and successful completion of a minimum of 12 hours of course work in the 12-month period prior to completion of the comprehensive examinations;
2. Enrollment for at least 12 hours every year;
3. Successful completion of all course work and comprehensive examinations within a maximum of 60 months after commencing the program; and
4. Forty-five (45) graduate hours in residence, including dissertation.

DOCTOR OF MANAGEMENT IN INFORMATION TECHNOLOGY

The Doctor of Management in Information Technology (D.M.I.T.) at Lawrence Technological University is an intensive part-time program designed to provide advanced education for leaders in the information technology (IT) industry. The curriculum represents the integration of business practice with scholarship, and emphasizes rigorous analytical skills and in-depth managerial and technical knowledge. The program seeks to prepare students for careers as innovators and problem solvers in the IT arena by providing thorough preparation in both the theory and practice of acquiring and managing IT resources in the enterprise. Graduates of the program will be at the center of an information-based society that is employing IT with ever-increasing sophistication in every facet of life, and be ready to assume significant roles in the world’s rapidly growing high technology work force.

D.M.I.T. CURRICULUM DESIGN

Lawrence Tech’s D.M.I.T. curriculum comprises coursework in major, minor and research methods fields, and research in the major field towards a dissertation. Coursework in the program is offered in the following three areas:

1. The major in Information Technology (database technology, e-business, IT management, systems development and software engineering);
2. The minor in Business Administration (accounting, finance, management and organizational behavior, management science, marketing, and operations management); and

...
3. Research methods (IT research methodology, quantitative methods, and modeling an simulation). All students must complete work in all three of these areas. The major (dissertation) field shall be information technology, whereas the minor field may be chosen from the specialized fields within business administration, or a related field. A minor field may be external to the College of Management. Examples are international business, manufacturing systems, engineering, and computer science.

D.M.I.T. ADMISSION

Admission to the program is competitive and the attainment of a specific set of minimum qualifications does not assure admission. Instead, admission is granted to the candidates deemed to be most qualified to achieve success. In general, applicants must:

• Hold a master’s degree or equivalent in the fields of study in IT from an accredited college or university with a GPA of 3.3 or higher.

Students with an out-of-field master’s degree are required to complete the prerequisite Pre-Foundation Core and Information Technology Foundation courses before starting the D.M.I.T. Program;

• Have accumulated five years of experience in an appropriate technical or managerial position in a corporate, governmental or non-profit organization;

• Students whose native language is not English are required to take TOEFL or IELTS and TSE. Minimum acceptable score is 550 on the written TOEFL or 250 on the computerized version. Minimum acceptable IELTS is 7.0. TOEFL/IELTS requirement is waived for those international students who have completed their degrees at a recognized U.S. university. In addition, minimum acceptable TSE score is 74 percentile;

• Provide three appropriate letters of recommendation;

• Provide a hand-written statement indicating the applicant’s chief academic interest, strengths and limitations, reasons for selecting the major field, and for choosing Lawrence Tech.

• Complete an interview (diagnostic evaluation) with the D.M.I.T. Program Committee.

Students who have exceptional merit in one of the above criteria but do not meet all admission criteria may be admitted under special circumstances determined by the Admissions Committee.

Admitted students are required to take the GMAT/GRE for purposes of benchmarking and academic advising during the first semester of study.

D.M.I.T. FOUNDATION COURSES

Students entering the D.M.I.T. degree program must have taken courses in the areas fundamental to succeeding in graduate coursework in the management of IT. These include software development and quantitative methods, as well as introductory courses in business and management. Students without this background must take courses as determined at the time of application. Information Technology Foundation courses lay the groundwork for the D.M.I.T. coursework. It includes an integrative cross-section of information technology and business administration fields.

Successful completion of the Information Technology Foundation courses demonstrates 1. competence in database systems and administration, application design and development, and data communications, and 2. graduate-level preparation or equivalent in organizational behavior, e-commerce and management of information systems.

Rules regarding the D.M.I.T.’s Information Technology Foundation

1. Waivers for courses in information technology, quantitative methods and foundations of business and management can be made for:

• Courses taken at accredited (or equivalent) schools with a 3.00 (B) grade or better;

• Courses taken at non-accredited schools, to be evaluated on an individual basis;

2. Courses over seven years old will generally not be accepted;

3. Students must achieve a GPA of at least 3.25 in the IT foundation courses taken at accredited (or equivalent) schools. Substitute courses can be used to complete the GPA;

4. Foundation courses may be taken after admission into the D.M.I.T. based on an applicant’s background only if the prerequisites of the curriculum are observed when registering for major and research methods courses;

5. A candidate must demonstrate competence in the information technology foundation through successful completion of a diagnostic evaluation. The form of the evaluation is to be decided by the D.M.I.T. program director in consultation with the D.M.I.T. Program Committee.

STEPS IN THE D.M.I.T. PROGRAM

1. Complete the application and include:

• Official transcripts from all community colleges and universities attended

• English proficiency results (where applicable)

• Three letters of recommendation

• Professional resume

• Handwritten statement of purpose

2. Attend a diagnostic evaluation interview

3. Coursework

Complete 36 credit hours of coursework.

4. Comprehensive Examinations

Take written and oral examinations upon completion of the courses in the major and research methods categories.
5. Dissertation
- Register for the dissertation proposal course
- Submit and present your research proposal to the supervisory committee
- Register for the dissertation credit hours
- Perform research and write dissertation
- Apply for graduation
- Defend dissertation

**SELECTING D.M.I.T. COURSEWORK**

After obtaining approval for the curriculum, major and minor courses are to be taken as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS8013</td>
<td>IT Life Cycle Processes</td>
</tr>
<tr>
<td>MIS8023</td>
<td>Advanced Data Management</td>
</tr>
<tr>
<td>MIS8033</td>
<td>IT Systems Architecture</td>
</tr>
<tr>
<td>MIS8043</td>
<td>IT Leadership and Management</td>
</tr>
<tr>
<td>MIS8053</td>
<td>Advanced topics in IS</td>
</tr>
</tbody>
</table>

Minor courses should be selected from the accepted fields of study above. A student may include a special minor field (a field not listed as a major field above) in his/her curriculum provided it is adequately justified by the student and appropriate to the student’s program of study. If a student desires a special minor field external to the College of Management, then the student must petition to include the special external minor field.

**D.M.I.T. RESEARCH METHODS FIELD**

The Research Methods requirement consists of 12 hours of coursework. This component of the curriculum is designed to provide students with a mastery of research philosophy, design and methodology. This component covers methods and techniques relevant to the managerial and technical IT life cycle processes. The courses are at the graduate level, covering the methods, techniques, notations and computer-based tools for performing information technology research, design and development and implementation. A student must complete 12 hours of required coursework in the Research Methods field, namely:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS7813</td>
<td>Research Methodology</td>
</tr>
<tr>
<td>MIS7823</td>
<td>Quantitative Methods I</td>
</tr>
<tr>
<td>MIS7833</td>
<td>Quantitative Methods II</td>
</tr>
<tr>
<td>MIS7843</td>
<td>Modeling and Simulation</td>
</tr>
</tbody>
</table>

**D.M.I.T. COMPREHENSIVE EXAMS**

A student must demonstrate competence in the major and research Methods by the successful completion of written comprehensive examinations. All coursework in the field must have been completed before taking the comprehensive examination. A student is eligible for a written comprehensive examination if he/she has completed
1. Coursework in the major field
2. Coursework in the Research Methods field.

**D.M.I.T. DISSERTATION**

Each D.M.I.T. candidate must complete a dissertation based on a dissertation proposal. The dissertation proposal must plan research work on an appropriate applied research topic with the rigor and sophistication expected of doctoral level work. The student must register for the Dissertation Proposal course (3 cr. hrs.). The proposal must be submitted for acceptance by the student’s dissertation committee. The research work should demonstrate innovation and applicability of state-of-the-art principles in the chosen field to real-world problems of present and future interest, i.e. relevance to commerce and industry. Where feasible the Dissertation Committee consists of the members of the Supervisory Committee and one external member, preferably from an organization where the research can be applied.

**D.M.I.T. RESIDENCY REQUIREMENTS**

General residency requirements for students enrolled in the D.M.I.T. program include:
1. Registration and successful completion of a minimum of 12 hours of coursework in the 12-month period prior to completion of the comprehensive examinations;
2. Enrollment for at least 12 hours every year;
3. Successful completion of all coursework and comprehensive examinations within a maximum of 60 months after commencing the program; and
4. Forty-five (45) graduate hours in residence, including dissertation.
ACC5002 FINANCIAL ACCOUNTING
Prerequisite: 0. Introductory examination of financial accounting data generated by business organizations. Emphasis on interpretation of accounting statements and reports and the appropriate use of financial accounting information in the decision-making process. Lect/Sem. 2 hrs. 3 hours credit

ACC5003 INTRO TO ACCOUNTING & FINANCE PRINCIPLES
Prerequisite: 0. Tools for financial decision-making using accounting data and cash flow measurements. The data and measurements used in financial ratios, financial math calculations, and risk-return analysis. Long and short term financial planning, valuation of bonds and stocks, and capital budgeting. Lect/Sem. 3 hrs. 3 hours credit

ACC5013 ACCOUNTING FOR DECISION MAKING
Prerequisite: 0. Introductory examination of accounting statements and reports and appropriate use of accounting information in the decision-making process. Basic concepts of financial accounting and cost accounting as applied to the information needs of the organization. Lect/Sem. 3 hrs. 3 hours credit

ACC6013 MANAGEMENT ACCOUNTING
Prerequisites: ACC5002, ACC5003 or ACC5013 or equivalent. Uses of managerial accounting information for planning and control. Case studies emphasize the role of accounting information in the decision-making process. Designing, implementing, and the use of planning and control systems to achieve a firm’s strategies. Lect/Sem. 3 hrs. 3 hours credit

ACC7113 FINANCIAL STATEMENT ANALYSIS
Prerequisite: ACC5002 and FIN5022 or ACC5003. Analysis of financial statements of business firms with an emphasis on the study of relationships within a set of financial statements at a point in time and with trends in these relationships over time. Primary attention on the tools and techniques used by managers. Lect/Sem. 3 hrs. 3 hours credit

COM6103 MANAGERIAL COMMUNICATION
Prerequisite: 0. Experience through team and individual assignments in using effective listening techniques; conducting interviews; organizing and running business meetings, project planning; writing business correspondence, proposals and reports; giving oral presentations; using computerized programs to design documents and graphics for presentation; and developing collaborative writing strategies. Lect/Sem. 3 hrs. 3 hours credit

DBA7013 INTRODUCTION TO INQUIRY AND RESEARCH METHODOLOGY
Prerequisite: Graduate standing. Preparing for performing doctoral level research, culminating in the dissertation. Includes identifying pertinent research topics, questions, critique of research ideas and designs, and evaluating and disseminating a dissertation. The philosophy of the dissertation, its requirements, and expectations for conducting substantive doctoral level inquiry, as well as the practical issues of choosing a dissertation committee, managing the process of writing a dissertation, and understanding the roles of the dissertation committee. Differentiating between inductive and deductive research and between the qualitative and quantitative research methods available for use. The literature review as well as the various parts of the dissertation and their relationship to each other. Ultimately, this course is designed to help students achieve a successful completion of the dissertation by providing a sound foundation in which to view the full range of the scope and depth that doctoral research entails. Lect. 3 hrs. 3 hours credit

DBA7023 QUALITATIVE RESEARCH TECHNIQUES
Prerequisite: DEA7013. Qualitative research techniques have gained significant respect as a viable and valid form of inquiry, especially as researchers have entered fields that include complex human systems and multiple human perspectives. Qualitative research techniques examined include: action research, ethnographic methodology, grounded theory building, phenomenological inquiry, and participative research. Appreciative Inquiry is noted as part of grounded theory building. Includes crafting research questions and attending to the larger pragmatic and theoretical context to shape them. The differences between deductive and inductive qualitative research are explored while exploring the qualitative research techniques listed above. Research mapping and evaluation of the qualitative research as well as the development of qualitative research instruments, where appropriate. For most students this form of research is new and they will be asked to design and conduct a project using this form of inquiry. Lect. 3 hrs. 3 hours credit

DBA7043 BUSINESS MODELING AND ANALYTICAL TECHNIQUES
Prerequisites: DBA7013, DBA7023, DBA7033. Continuation of Business Statistics. Incorporates correlation analysis, time series analysis, various regression techniques, and multivariate analysis. The concept of seasonality and how it needs to be addressed in forecasting is stressed. Projects involve undertaking or completing a forecast of product revenues, sales volumes, or some other area of interest related to their business specialty. The integration of the techniques into a “live” situation helps cement this knowledge and allows learning how these techniques are involved in the business world. For students with a strong economic or financial bent, econometric forecasting could be undertaken. Decision trees and other quantitative techniques discussed. As in Business Statistics and Survey Techniques, multi-method techniques are utilized to broaden the relevance and increase the rigor involved. Lect. 3 hrs. 3 hours credit

DBA7053 BUSINESS STATISTICS
Prerequisites: DBA7013, DBA7023. Basic fundamentals of quantitative methods. A grounding in the area of business statistics and probability. Survey analysis and the non-parametric statistical techniques that can be used to interpret the surveys. Analysis of Variance techniques is addressed, as these techniques are valuable in the completion of dissertation research. The method for providing this grounding to the students involves an actual development of a survey, population sample, analysis and then a report and presentation of the results of the survey and the implications that can be applied to the significant business area that is the student’s specialty. How the merging of qualitative methods can be applied to use multi-method research to provide a more balanced approach to research. This is continued in the Business Modeling and Analytical Techniques. Lect. 3 hrs. 3 hours credit
DBA8013 ADVANCED LEADERSHIP THEORY AND PRACTICE: CREATING STRATEGIC CHANGE LEADERS
Prerequisite: Graduate standing.
Introduces 21st century strategic leaders and organization change makers. Integrates theoretical and practical applications for effectively leading organizations in a constantly changing world. Students study leadership models that have helped move people in organizations toward a clear vision and mission. Distinctive culture transformations aimed at improving business growth will also be studied. Includes case studies of best practices of leadership and management that have been implemented in a variety of corporate, government, and not-for-profit organizations.
Lect. 3 hrs. 3 hours credit

DBA8023 GLOBAL ECONOMIC THEORIES: TRADE AND SYSTEMS
Prerequisite: Graduate standing.
Economic interdependence among nations has increased sharply in the past decade. The theoretical and institutional knowledge needed to understand the impact of culture, global politics, economic systems, and institutions. Interaction between public policies and private sector decision-making and investment. Patterns of global trade, investment, and financial flows. International institutions that play a key role in the economic integration process. Case studies from developed and developing economies to illustrate issues involved in competing in a dynamic world economy.
Lect. 3 hrs. 3 hours credit

DBA8033 INSTITUTIONS, STRUCTURES, AND SYSTEMS
Prerequisite: Graduate standing.
Society looks to government and organizations to implement policies and practices that contribute to sustainable development and intergenerational equity. Organizations’ councils and boards look to their management teams to ensure their success while balancing the interests of key stakeholders: investors, boards, employees, customers, strategic partners/suppliers, and communities. Examines the creation of the publicly held corporation, agency theory principal, corporate governance models, new accounting standards, and the role of values, ethics, and transparency. The objective is to better understand how to operate organizations with integrity, fiscal soundness, and to the long-term benefits to corporations and society at large. Case studies used for analysis and students complete an in-depth study of an organization’s governance structure and develop a set of recommendations that can be used not only for the organization but across its industry.
Lect. 3 hrs. 3 hours credit

DBA8043 GLOBAL MARKETING STRATEGY, STRUCTURES, AND SYSTEMS
Prerequisite: Graduate standing.
To remain competitive in today’s global markets, profitable growth from product innovation is a challenge to achieve and sustain. Begins with an overview of strategic marketing processes, industry structures, competitive environments, and continuous innovation. Qualitative tools introduced to help students determine a company’s mission, goals, and strategies. Quantitative tools determine a company’s best capabilities, opportunities, and competitive position. Students complete a market assessment and plan to launch a new product or service design.
Lect. 3 hrs. 3 hours credit

DBA8053 FINANCIAL VALUATIONS AND STRATEGIES
Prerequisite: Graduate standing.
An in-depth examination of corporate and public financial management, financial policies and practices, and financial institutions. The role of money and capital markets from the perspective of private sector financial and risk management. Quantitative tools, techniques, and technologies of modern financial markets will be examined as they pertain to modern money and capital markets. Emphasis on the theory and practice of financial decision-making by the leadership team to maximize an organization’s short- and long-term financial performance.
Lect. 3 hrs. 3 hours credit

DBA8063 STRATEGIC MANAGEMENT INFORMATION SYSTEMS AND DESIGN
Prerequisite: Graduate standing.
Enabling leaders to anticipate and evaluate the political, economic, and social impact of technology in an organization. The strategic relationship of information technologies and systems to the organization. The role of technology within the organization’s environment to determine its core and distinctive competencies to sustain a competitive advantage. Management of innovation and technology and knowledge transfers between nation-states.
Lect. 3 hrs. 3 hours credit

DBA8073 ORGANIZATION DEVELOPMENT AND TRANSFORMATION: LEADING ORGANIZATIONAL CHANGE
Prerequisite: Graduate standing.
Organizations and their surrounding environments are constantly changing. It is important for business leaders to understand the nature of the various changes and their own responses. The conceptual frameworks and tools to lead and orchestrate organizational change. Leading theories and models used in management of organizational change. Case studies associated with organizational change, including methods of discovery, envisioning change, and various design process and implementation issues. Students complete a self-assessment on their change leadership capabilities to facilitate a change initiative with their organization and develop a change management system to lead a team, division, or organization from action to impact.
Lect. 3 hrs. 3 hours credit
DBA8083 ADVANCED TOPICS: EMERGING FIELDS OF BUSINESS
Prerequisite: Graduate standing. Emerging fields in business administration, specifically focusing on new theories or practices in strategic leadership and change management. Lect. 3 hrs. 3 hours credit

FIN5012 ECONOMIC PROCESSES
Prerequisite: 0. Basic theory underlying both macro-economics and micro-economics. Basic tools that economists have devised to analyze inflation, unemployment, aggregate demand, and monetary and fiscal policies. Determinants of consumer demand, producer supply, and their interaction in the marketplace. Lect/Sem. 2 hrs. 2 hours credit

FIN5022 INTRODUCTION TO FINANCE
Prerequisites: FIN5012 and ACC5002. Fundamentals of financial management from the viewpoint of the chief financial officer. Current asset management, risk management and aversion, financial leverage and analysis, capital budgeting, long term financing, capital markets, cost of capital, mergers, failures and reorganization, and international finance. Cases analyze problems and introduce solutions. Lect/Sem. 2 hrs. 2 hours credit

FIN6013 FINANCIAL MANAGEMENT
Prerequisites: ACC5002 and FIN5022 or ACC5013. The allocation of wealth over time, firm valuation, investment decisions, long-term decision, cost of capital, equity management, dividend policy, and the effects of corporate and personal income taxation on the corporate decision making process. Theory on which current financial techniques are based. Contributions of major authors to finance theory. Applications of these theories to contemporary usage such as return measurement, risk measurement, capital structure, capital asset analysis and dividend policy. Lect/Sem. 3 hrs. 3 hours credit

FIN6023 ADVANCED FINANCIAL MANAGEMENT
Prerequisite: FIN6013. Advanced treatment of the investment, financing, dividend and working capital decisions with focus on current issues of strategic importance. Lect/Sem. 3 hrs. 3 hours credit

FIN7013 FINANCIAL MARKETS AND INSTITUTIONS
Prerequisite: FIN6013. Study of money and capital markets and institutions and their managerial and environmental problems, government. Lect/Sem. 3 hrs. 3 hours credit

FIN7023 INVESTMENT MANAGEMENT
Prerequisite: FIN6013. Analysis of the investment process, measurement of risk and return, security valuation models, and performance evaluation. An introduction to portfolio theory and practice. Lect/Sem. 3 hrs. 3 hours credit

HRM5023 LEADING ORGANIZATIONAL CHANGE
Prerequisite: 0. Dealing with change is part of every individual’s job in an organization today. Given this, individuals must have the capacity to manage and lead a division or organization’s change agenda. The conceptual framework and tools to help individuals deal with organizational change. Social and organizational change that provides the foundation to lead a change initiative. Strategies and tactics used in organizational development and behavior are presented. An OD process called Appreciative Inquiry helps students learn how to embrace any change agenda. Lect/Sem. 3 hrs. 3 hours credit

HRM6113 MANAGEMENT AND ORGANIZATION DEVELOPMENT
Prerequisite: HRM6023. Practical methods for identifying organizational employee inhibitors to productive human performance. Organizational and human interventions introduced and applied to cases and on-the-job problems. Lect/Sem. 3 hrs. 3 hours credit

HRM6123 PERFORMANCE AND PRODUCTIVITY IMPROVEMENT
Prerequisite: HRM6023. Diagnosing causes for inadequate performance due to climate and cultural variables. Various assessment tools demonstrated and applied on the job at the work group, departmental or organization-wide level. Lect/Sem. 3 hrs. 3 hours credit

HRM6133 MANAGING THE PROJECT ORGANIZATION
Prerequisite: HRM6023 or MGT6153. Project, matrix and mixed-matrix organization structures, methods and tools. Focus from the perspective of the project manager and concentration on developing the project team and managing the boundary with the organization and clients. Lect/Sem. 3 hrs. 3 hours credit

HRM6143 MANAGING MULTI-CULTURAL ORGANIZATIONS
Prerequisite: HRM6023. Analysis of culturally diverse versus traditional workforce organization models. What shifting demographics means for management practice and productivity model designs. Lect/Sem. 3 hrs. 3 hours credit
INT5063 TOPICS IN INTERNATIONAL BUSINESS
Prerequisite: 0. Advanced topics in international management. A substitute for MGT6053.
Perspectives in International Business, and a core or elective in the MBA program.
Lect/Sem 3 hrs. 3 hours credit

MGT5012 STATISTICAL METHODS
Prerequisite: Basic Math. The analytic aspects of business problem-solving. Specific techniques
and management, marketing and financial models evaluated for their practical application to organi-
izational requirements.
Lect/Sem. 2 hrs. 2 hours credit

MGT5032 LEGAL ENVIRONMENT
Prerequisite: 0. The legal system and the framework for judicial decision making. Analysis of gen-
eral principles of tort law and constitutional liberties and an examination of general concepts of busi-
ness principles including contract, sales, agency, partnerships, corpo-
ration of general concepts of business. Lect/Sem. 3 hrs.

MGT5042 QUANTITATIVE METHODS
Prerequisite: MGT5012. Deterministic and stochastic analytical tools and concepts such as
cost efficiency, service delivery, and when appropriate, profit. The analytic concepts include probability theory, statistics, and utility
theory, linear models, linear programming, and network analysis.
Lect/Sem. 2 hrs. 2 hours credit

MGT5043 STATISTICS & QUANTITATIVE METHODS
Prerequisite: 0. Fundamentals of statistical concepts and basic management science tools. Statistics
and management science provide the tools using a number of tech-
niques developed to assist the decision-making process at vari-
ous levels of management.
Lect/Sem. 3 hrs. 3 hours credit

MGT6013 LEADERSHIP & MANAGEMENT
Prerequisite: 0. Scenario: Senior staff position reporting to the president. Focus on introducing and
demonstrating techniques/applications required in problem identification/solving; team-build-
ing; conflict resolution/negotiation; oral/written communications; and interpersonal/leadership skills.
Lect/Sem. 3 hrs. 3 hours credit

MGT6043 LAW, ETHICS & BUSINESS IN SOCIETY
Prerequisite: 0. Integration of basic principles of law, contracts, agencies, organizations, and the
interactions between business entities and society-at-large in an ethical framework. By examining society’s values
and needs and the ethical assumptions, attitudes, values and behavior of business institutions, future managers will have
a basis for making ethical decisions that affect society. Balancing the needs and the values of organizations with those of society represents
the significant ethical dilemma. A systematic view of the place of business institutions enables managers to determine the
effect of their actions on society. Both conceptual and applied considerations given weight.
Lect/Sem. 3 hrs. 3 hours credit

MGT6053 PERSPECTIVES IN INTERNATIONAL BUSINESS
Prerequisite: 0. Examination of the size and scope of international business and its impact on the
domestic economy. Rules of multinational corporations, institutional structure and economic theories,
and environmental constraints. Emphasis on regional and ethical issues in the operation of multi-national corporations and strategic issues in international business.
Lect/Sem. 3 hrs. 3 hours credit

MGT6063 STRATEGIC MANAGEMENT
Prerequisites: HRM6023, OPM6033, MGT6013, MKT6013 and FIN6013. A capstone business class. The development of the
administrative perspective on management, including establishing and analyzing policy and strategy in various settings, as well as
the relationships between administrative decision making and important social issues. Case methods and computer simulations
used. Lect/Sem. 3 hrs. 3 hours credit

MGT6123 INTERNATIONAL MARKETING MANAGEMENT
Prerequisites: MKT6013. Management of foreign market operations. Reasons for marketing overseas, potential entrances to
foreign markets, and how environmental factors and barriers affect international markets.
Lect/Sem. 3 hrs. 3 hours credit

MGT6133 INTERNATIONAL FINANCIAL MANAGEMENT
Prerequisite: FIN6013. Application and limitations of business finance theories and practices when applied to the
financial management of international business. Inter-national sources of funds, the foreign
exchange rates and markets, foreign exchange risk management, cost of capital and financial structure, and capital budgeting for foreign projects.
Lect/Sem. 3 hrs. 3 hours credit

MGT6153 PROJECT MANAGEMENT
Prerequisite: 0 *(may not be taken for credit after MIS6153). Techniques, tools and skills needed by a project manager to com-
plete a major project on time, within budget, and with successful results. Focus on planning and
control over the life of the project with coverage of the project life cycle, project plan development,
PERT and CPM, computer based project control tools, resource loading, scheduling, costing, and
decision making in the project environment. Lect/Sem. 3 hrs. 3 hours credit

MGT6163 FOUNDATIONS OF BUSINESS
Prerequisite: 0. Integrated introduction to business topics in accounting, finance, strategy and market-
ing. Lect/Sem. 3 hrs. 3 hours credit

MGT6173 FOUNDATIONS OF MANAGEMENT
Prerequisite: 0. Integrated introduction to management topics in leadership, human resource man-
gement, and organizational behavior. Lect/Sem. 3 hrs. 3 hours credit

MGT6213 DIRECTED STUDY
Prerequisite: 0. Hands-on application provides the opportunity to apply all basic concepts of project
management, build on new competencies and test skills. Students work with an integrated project team on a project of their choice. They take the role of project
administrator, assume responsibilities for project planning, scheduling, and control. The final exam includes a major review presenta-
tion on project progress and performance. Stresses lessons learned from project successes, failures, and near misses. Lect/Sem. 3 hrs. 3 hours credit
MGT6223 PROJECT RISK & PROJECT QUALITY MANAGEMENT  
Prerequisite: MGT6153. The organized process of identifying and measuring risks on a project, and the developing, selecting, and managing options for coping with them on the project. Qualitative and quantitative assessment of uncertainties affecting cost, revenue, schedule, and quality of a project. Application of quality tools and techniques to the management of the product of the project. Continuous improvement tool and topics include check sheets, cause and effect, criteria rating, affinity analysis, process flow diagramming, histograms, run charts, pareto charts, and control charts. Lect/Sem. 3 hrs. 3 hours credit

MGT6233 BUSINESS MANAGEMENT STRATEGIES IN E-COMMERCE  
Prerequisite: 0. Overview of e-commerce from a business perspective. Origin and growth of e-commerce, electronic payment systems, how e-commerce business practices differ from traditional business practices, exploration of current e-businesses, international aspects and impact from e-commerce, deployment of an e-business strategy on an existing company and development of a new e-business or DOT COM company. Lect/Sem. 3 hrs. 3 hrs credit

MGT6543 MBA MASTERS PROJECT/THESIS  
Prerequisites: Courses appropriate to the subject of study. Co-requisite: Approval of qualified faculty member and director of graduate programs prior to registration. Student reviews and develops a thesis proposal which defines a topic of thesis research, outlines the scope and degree of abstraction and investigates issues raised in the field of management. Upon acceptance, the student pursues in-depth research directed by an assigned thesis advisor. All papers must be approved by the advisor and presented before the dean or designated representative. Lect/Sem. 3 hrs. 3 hours credit

MGT6773 GLOBAL BUSINESS OPERATIONS PART 2  
Prerequisite: MGT6776. Application of global business management skills to a practical work environment through a specifically designed work project or case study report. Student works independently or in teams. Lect/Sem. 3 hrs. 3 hours credit

MGT6776 GLOBAL BUSINESS OPERATIONS PART 1  
Prerequisites: FIN6013, MGT6053, MKT6013, or approval from graduate director. Provides a decision-making criteria for international managers, combining strategies for managing, financing, and marketing in the international competitive, legal, political, cultural, and organizational setting. A management approach focusing on tasks that have to be performed to succeed in foreign markets which are becoming increasingly competitive. Changes in the global environment and their implications for the modern manager. Marketing strategies and management practices used by companies seeking opportunities outside the home market examined. Analyses of international financial factors that have no domestic counterparts. The international financial instruments, markets, and institutions with which the corporation must operate to manage foreign exchange risk and carry out multinational working capital policies and foreign long term investment plans. Lect/Sem. 6 hrs. 6 hours credit

MGT7016 CI-1 FOUNDATIONS OF BUSINESS  
Prerequisite: 0. Module 1 recognizes that the diverse group of individuals entering the CI*MBA (Career Integrated MBA) have differing business education and experience. To bring students a common level of understanding, faculty use case studies, computer simulations, and workshops to show how concepts from economics, marketing, accounting and finance relate to management of business in the real world. Learning how to manage the finances of a business. Lect/Sem. 6 hrs. 6 hours credit

MGT7026 CI-2 FOUNDATIONS OF MANAGEMENT  
Prerequisite: MGT7016. This module integrates core management principles designed to develop a student’s interpersonal, managerial and leadership skills critical for success in the 21st century. Working independently and in teams, students use cases, simulations, and role-playing to experience the importance of effectively managing relationships and create the capacity for change within an organization. Now that students understand the finances of a business they focus attention to managing the human resources of the business. Lect/Sem. 6 hrs. 6 hours credit

MGT7036 CI-3 BUSINESS MANAGEMENT  
Prerequisite: MGT7026. After obtaining a foundation of management and business principles, students in Module 3 develop marketing strategies integrated with critical financial decision-making that emphasize the interrelationship of the firm and society. In essence, after obtaining the knowledge on internally running and managing a business, they learn how to market their product or service to domestic and international markets and perform the financial analysis necessary to insure market viability. Lect/Sem. 6 hrs. 6 hours credit

MGT7046 CI-4 PRODUCTION AND OPERATIONS MANAGEMENT  
Prerequisite: MGT7036. After obtaining a foundation in financial analysis, leadership, and marketing, students are introduced to various quantitative tools and inventory models used in designing, planning, scheduling and controlling operating systems. In essence, students will now learn how to manage the physical operations of the business and how to measure the quality of the product or service produced. Lect/Sem. 6 hrs. 6 hours credit

MGT7056 CI-5 STRATEGIC PLANNING CAPSTONE  
Prerequisite: MGT7046. This capstone module is designed to integrate concepts of strategic planning such as, visioning and adapting to internal and external environmental changes. In an organization setting ranging from a small business to a global corporation, students develop goals, strategies, and timelines to implement a strategic planning process. In this module, students tie all the concepts they have learned in the previous modules together and learn how to insure the long-term success of a business. Lect/Sem. 6 hrs. 6 hours credit

MGT7066 CI-6 MANAGEMENT APPLICATIONS  
Prerequisite: MGT7056. This program capstone module accomplishes two goals. First, students will complete their program by serving as junior management consultants for their corporation in an area that they intend to direct their career. They are responsible for resolving a specific manage-
MGT7123 TOPICS IN MANAGEMENT
Prerequisite: 0. Topic or topics of current interest in the management field. Course may focus on a single topic, or it may cover a wide variety of topics, at the discretion of the faculty member. Repeated enrollment for different topics is permitted. Lect/Sem. 3 hrs. 3 hours credit

MIS5002 INTRODUCTION TO PROGRAMMING
Prerequisite: 0. Introduction to a high level programming language, including design, syntax, compilation, debugging and testing. Lect/Sem. 2 hrs. 2 hours credit

MIS5012 ADVANCED PROGRAMMING
Prerequisite: MIS5002. Continuation of MIS5002. Students extend their experience and knowledge of programming. Lect/Sem. 2 hrs. 2 hours credit

MIS503 ORACLE SQL & PL/SQL
Prerequisite: MIS613, MCS3543 or MCS5303. Introduces the functioning of the Oracle database from a hardware and software perspective. Students review relational and object relational database concepts and learn Oracle’s PL/SQL language. As a test of skills, students complete various projects in creating database objects, controlling user access and writing short executable statements. Lect/Sem. 3 hrs. 3 hours credit

MIS513 APPLICATIONS DEVELOPMENT USING ORACLE
Prerequisites: MIS5103. How to build applications using Oracle Developer. How to create simple and complex input forms and event-related triggers to handle data validation and custom data processing. How to generate reports, the various styles one can employ when creating a report and reports with embedded objects, such as charts and graphs. Lect/Sem. 3 hrs. 3 hours credit

MIS5123 SYSTEM DESIGN AND DEVELOPMENT USING ORACLE
Prerequisite: MIS5103. Further defines abilities to design an information system using Oracle’s Designer. Data modeling and relational database design, refining and reviewing ER diagrams. How to record business tasks and requirements, using the repository to classify various database objects and generate database objects. Using Designer to generate input forms. Lect/Sem. 3 hrs. 3 hours credit

MIS5133 SERVER DESIGN AND CONFIGURATION USING ORACLE
Prerequisites: MIS5103. How to establish and maintain the Oracle database and Designer Repository. How to set up, maintain and manage the Designer Repository taking into consideration such aspects as archiving, access control and backup. How to set up an Oracle database, query database views to gain system information and manage privileges and roles. Methods used to restore an Oracle database. Lect/Sem. 3 hrs. 3 hours credit

MIS6013 MGMT INFO SYSTEMS
Prerequisite: 0. Information systems used by management in different environments. Planning, controlling, and implementing management information systems. Hardware and software examined. Lect/Sem. 3 hrs. 3 hours credit

MIS6113 DATABASE MODELS
Prerequisite: MIS6013, MIS5002 or equivalent. Introduction to database systems with emphasis on the relational model. Data definition and data manipulation languages, normalization, query languages, optimization, concurrency, security, data administration, and information resource management. Hierarchical, network, and object database systems will be discussed. Introduces distributed database theory. Lect/Sem. 3 hrs. 3 hours credit

MIS6123 ANALYSIS AND DESIGN OF COMPLEX SYSTEMS
Prerequisite: MIS6013, MGT6163, MGT6173 or equivalent. Examination of the tools and methods of traditional systems development, including systems analysis, design, test and implementation. Focus on structured analysis techniques. Lect/Sem 3 hrs. 3 hours credit

MIS6143 TELECOMMUNICATIONS & NETWORKS
Prerequisite: MIS6013 or equivalent. Analysis, design, and implementations of data, voice, image and video communication networks. Computer and network technologies, teleprocessing, local and wide area networks, communications, protocols, and telephone systems. Lect/Sem. 3 hrs. 3 hours credit

MIS6153 PROJECT MANAGEMENT – IT
Prerequisite: 0. May not be taken for credit after taking MGT6153. Techniques, tools and skills needed by a project manager to complete a major project on time, within budget, and with successful results. Focus on planning and control over the life of the project with coverage of the project life cycle, project plan development, PERT and CPM, computer based project control tools, resource loading, scheduling, costing, and decision making in the project environment. Examples and homework projects from Information Systems. Lect/Sem. 3 hrs. 3 hours credit

MIS6213 DIRECTED STUDY
Prerequisite: 0. Requires approval of a qualified full time faculty member and the graduate director prior to registration. Design and execute an individual course of study in consultation with a faculty member. Note: A Directed Study cannot be taken in lieu of any core courses, and can only count once toward graduation. Lect/Sem. 3 hrs. 3 hours credit

MIS6231 DIRECTED PRACTICAL TRAINING I
Prerequisite: Appropriate courses. Requires approval of a qualified full time faculty member and the Graduate Director prior to registration. Lect/Sem. 1 hr. 1 hour credit

MIS6241 DIRECTED PRACTICAL TRAINING II
Prerequisite: Appropriate courses. Requires approval of a qualified full time faculty member and the Graduate Director prior to registration. Lect/Sem. 1 hr. 1 hour credit
MIS643 MSIS MASTERS PROJECT/THESIS
Prerequisite: Courses appropriate to the subject of study. Co-requisite: Approval of qualified faculty member and graduate director prior to registration. Student reviews and develops a thesis proposal which defines a topic of thesis research, outlines the scope and degree of abstraction, and investigates issues raised in the information systems field. Upon acceptance, the student pursues in-depth research directed by an assigned thesis advisor. All papers must be approved by the advisor and be presented before the dean, or designated representative. Sem. 3 hrs. 3 hours credit.

MIS7123 TOPICS IN INFO SYSTEMS
Prerequisite: Permission of graduate director and courses appropriate to the field of study. Topic, or topics covered are of current interest in the information systems field. Course may focus on a single topic, or it may cover a variety of topics at the discretion of the faculty member. Repeat enrollment for different topics is permitted. Lect/Sem. 3 hrs. 3 hours credit.

MIS7413 SOFTWARE DEVELOPMENT I
Prerequisites: MIS5012, MIS6123. Examination of software development practices. Focuses on the management of software projects, including metrics, project planning and management, configuration management, and software assurance. Lect/Sem. 3 hrs. 3 hours credit.

MIS7423 WEB AND ELECTRONIC COMMERCE SYSTEMS
Prerequisite: MIS5012, MIS6123. Survey of Web-based tools useful in electronic commerce. Examination of electronic commerce business issues. Lect/Sem. 3 hrs. 3 hours credit.

MIS7433 TECHNICAL INFRASTRUCTURE
Prerequisite: MIS5012, MIS6143, MIS6123, MIS6113. Principles of operating systems including memory management, virtual memory, disk scheduling, concurrent programming, distributed systems, CPU scheduling, design principles, real-time OS and other operating systems concepts as they relate to information systems. Examines current real-world operating systems including NT and UNIX with emphasis on project work. Lect/Sem. 3 hrs. 3 hours credit.

MIS7443 SOFTWARE DEVELOPMENT II
Prerequisite: MIS7413 and permission. Continuation of MIS7413, focusing on conventional and object-oriented methods of software development. Lect/Sem. 3 hrs. 3 hours credit.

MIS7453 EXPERT SYSTEMS
Prerequisites: MIS5012. Overview of the theory and structure of expert systems. Applications of expert systems to business cases. Lect/Sem. 3 hrs. 3 hours credit.

MIS 7493 TECHNICAL CAPSTONE
Prerequisites: MIS6123, MGT6153, MIS6113, and in the final nine hours of study. Cumulative course that integrates learning in software development, system analysis, database and other MIS courses. Lect/Sem. 3 hrs. 3 hours credit.

MIS7523 ORGANIZATIONAL COMMUNICATION
Prerequisite: MIS6013 or equivalent. Survey of organizational communications from a theoretical and practical perspective. Examination of how collaborative information systems can improve organizational communications. Lect/Sem. 3 hrs. 3 hours credit.

MIS7533 CONTRACTS, ETHICS AND INTELLECTUAL PROPERTY
Prerequisite: MIS5012. Introduction to legal issues associated with information systems, focusing on intellectual property rights and the role of contracts. Examination of ethical frameworks useful in information systems. Lect/Sem. 3 hrs. 3 hours credit.

MIS7593 MANAGING INFORMATION TECHNOLOGY
Prerequisite: Completion of required core and concentration courses. Strategic management of information technologies and process within an organization. Methods of identifying new trends and technologies and how they become part of an organization’s strategic plan. Developing plans for implementing IS plans, including information systems cost/benefit, risk, and value/impact analysis. Lect/Sem. 3 hrs. 3 hours credit.

MIS7613 WEB PROGRAMMING
Prerequisites: MIS5002, MIS6013 or equivalent experience. Introduction to popular web programming languages such as XHTML, Javascript, VB script and ASP. How to develop, program and design web pages and web sites. How to incorporate databases into their web sites using Active Server Pages and how to interact with Common Gateway Interface scripts on Web servers. Lect/Sem. 3 hrs. 3 hours credit.

MIS7623 DATA WAREHOUSING AND ANALYSIS
Prerequisites: MIS6013 or equivalent experience. How data is used in organizations to gain competitive advantage. Data Warehousing, OLAP (On-Line Analytical Processing) and Data Mining and how these concepts are employed in various industries. Lect/Sem. 3 hrs. 3 hours credit.

MIS7633 E-COMMERCE INFRASTRUCTURE
Prerequisites: MIS5012, MIS6013 or equivalent experience. Underlying infrastructure required for e-commerce to succeed. Internet Security, web servers, IP networking and electronic payment systems. Lect/Sem. 3 hrs. 3 hours credit.

MIS7643 ENTERPRISE INTEGRATION
Prerequisites: MIS6013, MGT6163, MGT6233. Overview of the linkages that connect organizational processes and how these are supported by Information Systems. Supply chain management, customer relationship management and enterprise resource planning. Lect/Sem. 3 hrs. 3 hours credit.

MIS7693 E-COMMERCE CAPSTONE
Prerequisites: MGT6233, MIS7613. Cumulative course that integrates learning in E-Commerce business and technical courses. Combining Web programming languages and business strategy into the formation of an e-business or DOT COM company. How to use electronic payment systems, databases and dynamically generated Web pages. Lect/Sem. 3 hrs. 3 hours credit.

MIS8000 IT OUTCOME ASSESSMENT
Prerequisites: all courses. Students prepare and take standardized Information Systems certification examinations. Students must earn an acceptable score to successfully complete this course.
MKT5012 INTRODUCTION TO MARKETING
Prerequisite: FIN5012. Lectures and cases examine and analyze the marketing process with special emphasis placed on the development of integrated approaches to management and control operational marketing problems. Components of the marketing mix: product management, pricing, promotion, personal selling, buyer behavior, marketing channels, distribution and segmentation. Lect/Sem. 2 hrs. 2 hours credit

MKT5013 INTRODUCTION TO ECONOMIC & MARKETING PRINCIPLES
Prerequisite: 0. Marketing decisions and strategies are linked to economic principles. Economic concentration is the first area of focus and seeks to prepare students for a better understanding of consumer behaviors in the marketplace. Understanding these behavioral traits will better facilitate marketing initiatives and strategies. Introduces the marketing process and key components of the marketing mix. Learning validated with a integrated research opportunity. Lect/Sem. 3 hrs. 3 hours credit

MKT6013 MARKETING MANAGEMENT
Prerequisite: MKT5012 or MKT5013. Principles and concepts of marketing management. Analysis of the marketing environment, problems and opportunities. Development of objectives, plans, and strategies for the marketing function. Lect/Sem. 3 hrs. 3 hours credit

MKT6023 E- MARKETING & THE GLOBAL ECONOMY
Prerequisites: 0. Current trends in e-business marketing and communications and the use of the Internet as a new business venture versus a new medium for the communication strategy. Insight into online consumer behavior, Internet branding versus outer-net branding and business-to-business marketing. The impact the boundary-less Internet on the global economy. Lect/Sem. 3 hrs. 3 hours credit

MKT7123 TOPICS IN MARKETING MGT
Prerequisite: MKT6013. Topic or topics of current interest in the marketing field. Course may focus on a single topic, or it may cover a wide variety of topics, at the discretion of the faculty member. Repeat enrollment for different topics is permitted. Lect/Sem. 3 hrs. 3 hours credit

OPM6023 MANAGEMENT SCIENCE
Prerequisite: MGT5012. Deterministic and stochastic analytical tools and concepts such as cost efficiency, service delivery, and where appropriate, profit. Analytic concepts include probability theory, statistics, and utility theory, linear models, linear programming, and network analysis. Lect/Sem. 3 hrs. 3 hours credit

OPM6033 OPERATIONS MANAGEMENT
Prerequisite: MGT5012 or MGT5043 department approval. All aspects of a manufacturing firm and service organizations from the manager’s perspective. Decision making in designing, planning, scheduling and control activities. Introduces application of the various quantitative tools to the many and varied problems in production systems. Lect/Sem. 3 hrs. 3 hours credit

OPM6113 INVENTORY MODELS WITH APPLICATION
Prerequisite: OPM6033. Inventory models used by industry. Theoretical extensions of models currently used. Lect/Sem. 3 hrs. 3 hours credit

OPM6123 QUALITY CONTROL TECHNIQUES
Prerequisite: OPM6033. Comprehensive survey of quality control techniques presently used in industry. Positive and negative features of these techniques. Lect/Sem. 3 hrs. 3 hours credit

OPM6133 MATERIALS, PROCESSES, & FACILITIES MANAGEMENT
Prerequisite: OPM6033. Managing technical aspects of the integration of industrial materials, processes and facilities. Lect/Sem. 3 hrs. 3 hours credit

OPM6143 CASES IN OPERATIONS MANAGEMENT
Prerequisites: OPM6033, OPM6133, and OPM6123. The “capstone” course. Case studies of operational environments. Students work jointly in teams and write individual short reports on cases they’re not presenting. Course must be taken in the final 6 hours of a student’s program. Lect/Sem. 3 hrs. 3 hours credit

OPM6153 ENTREPRENEURSHIP AND VENTURE MANAGEMENT
Prerequisite: 0. Characteristics, behavior, skills and functions of the entrepreneur. Approaches to creating, evaluating, and launching, new ventures. Cases, field studies, and self-assessment used extensively. Lect/Sem. 3 hrs. 3 hours credit

OPM6173 DISCRETE SIMULATION
Prerequisite: MGT5042. Simulation, modeling, and comparison with other problem solving techniques; simulation methodology including generation of random numbers and variables, time flow mechanisms, sampling considerations, and validation and analysis of simulation models and results; survey of discrete simulation languages; applications of simulations, including operating systems and networks. Lect/Sem. 3 hrs. 3 hours credit

OPM621X DIRECTED STUDY
Requires approval of a qualified full time faculty member and the graduate director prior to registration. Note: A Directed Study cannot be taken in lieu of any core course. Lect/Sem. 3 hrs. 3 hours credit
OPM6543 MSIO MASTERS PROJECT/THESIS
Prerequisite: Courses appropriate to the subject of study. Co-requisite: Approval of qualified faculty member and graduate director prior to registration. Student reviews and develops a thesis proposal which defines a topic of thesis research, outlines the scope and the degree of abstraction and investigates issues raised in the operations management field. Upon acceptance, students pursue an assigned thesis advisor. All papers must be approved by the advisor and presented before the dean or designated representative. Lect/Sem 3 hrs. 3 hours credit

OPM7123 TOPICS IN OPERATIONS MANAGEMENT
Prerequisite: Permission of graduate director and courses appropriate to the subject of study. Topic or topics covered are of current interest in the operations management field. Course may focus on a single topic, or it may cover a variety of topics at the discretion of the faculty member. Repeat enrollment for different topics is permitted. Lect/Sem 3 hrs. 3 hours credit

DMIT COURSES
MIS7813 INFORMATION TECHNOLOGY RESEARCH METHODOLOGY
Prerequisites: 0. Scientific methods of research including methods of investigation, hypothesis formulation, modeling and notations, model verification and validation as relevant to research in information technology are covered. Included is the formulation of a research proposal, determining appropriate methods of investigation and methods of validation. Lect/Sem. 3 hrs. 3 hours credit

MIS7823 QUANTITATIVE METHODS I
Prerequisite: Introductory course in statistics. Quantitative methods and statistical techniques used in managing, manipulating and interpreting data and information in the IT field. Topics include statistical distributions, frequency distributions, Pareto distribution, analysis of variance, standard deviation, correlation, significance, numerical integration, tests of normality, linear regression, prediction interval, multiple regression, multiple regression interval, Gaussian method, sampling distributions, decision analysis, statistical inference, probabilities, Bayesian theory and time series analysis. A range of applications exemplify these methods and techniques relevant to IT projects. Lect/Sem. 3 hrs. 3 hours credit

MIS7833 QUANTITATIVE METHODS II
Prerequisite: MIS7823. Advanced quantitative methods and statistical techniques used in managing, manipulating and interpreting data and information in the IT field. Study of advanced multivariate techniques include structural equation modeling, factor analysis and non-parametric statistics. Lect/Sem. 3 hrs. 3 hours credit

MIS7843 MODELING AND SIMULATION
Prerequisite: MIS7833. Processes and methods for modeling and simulation of proposed solutions using appropriate software technologies. Approaches include the building of models to simulate behaviors, and designing of prototypes to demonstrate concepts. Skills are developed to apply automated tools in project case studies. Lect/Sem. 3 hrs. 3 hours credit

MIS8013 INFORMATION TECHNOLOGY LIFE CYCLE PROCESSES
Prerequisites: DMIT admission; MGT6153 Project Management (or equivalent); Graduate course in Software Requirements Engineering (or equivalent); Graduate course in Software Management. A comprehensive perspective of Information Technology life cycle processes is taken as needed in organizations to lead and manage such processes. Best practices in the field of IT as promoted by international standards organizations are covered. Skills required to lead and manage IT processes in the managerial, contractual, development and operational perspectives are provided. Supporting and organizational processes that sustain the primary life cycle processes are considered including skills to lead to lead, manage and participate in software process improvement initiatives within the organization. Lect/Sem. 3 hrs. 3 hours credit

MIS8023 ADVANCED DATA MANAGEMENT
Prerequisites: MIS 6013 and MIS 6113 (or equivalent). Trends in advanced data management including data mining, data warehouse, OLAP (On-Line Analytical Processing), and object-oriented database. Best practices in the areas object technology are covered and state-of-the-art development tools are used within the context of a business case and group projects. Lect/Sem. 3 hrs. 3 hours credit

MIS8033 IT LEADERSHIP AND MANAGEMENT
Prerequisites: MIS7593 (or equivalent experience) and MIS8013. Advanced treatment of current IT leadership and management issues in the global business arena, including the role of the chief information officer as a change initiator, outsourcing as a solution strategy, and Business Process Re-Engineering. Lect/Sem. 3 hrs. 3 hours credit

MIS8043 INFORMATION TECHNOLOGY SYSTEMS ARCHITECTURE
Prerequisites: MIS6113 (or equivalent), MIS6123 (or equivalent), MIS 6143 (or equivalent), MGT6153 (or equivalent). A comprehensive framework for interpreting trends and drivers of information technology (IT) that influence the IT and systems architectures of an organization. A methodology for modeling the structure and behavior of such systems are used. Skills are acquired to use automated tools to design architectures. Lect/Sem. 3 hrs. 3 hours credit

MIS8053 ADVANCED TOPICS IN INFORMATION TECHNOLOGY
Prerequisites: MIS7413, MIS5012, MIS7023, or equivalent. Advanced treatment of the analysis and design of software systems, with special emphasis on concepts and techniques for mastering complexity of systems. Frameworks, design patterns and notations are covered to develop object-oriented solutions. Skill development to model solutions in the generic application domains. Lect/Sem. 3 hrs. 3 hours credit

MIS8053 ADVANCED TOPICS IN INFORMATION TECHNOLOGY
Prerequisites: MIS 6013, MIS 6113, and MIS 7613 or equivalent. Contemporary Web services, middleware (including Web application server), and distributed database topics in the IT field. Two contemporary technology bases behind these topics studied, namely Java on SunONE (including database interface JDBC) and C#/VBScript on Microsoft.NET (including database interface ADO). Includes a business case for group projects. Lect/Sem. 3 hrs. 3 hours credit
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ADMINISTRATION OF THE COLLEGES

Dean of Architecture and Design*  David M. Chasco
Chair, Architecture  David M. Chasco
Chair, Art and Design  Virginia North

Dean of Arts and Sciences  James S. Rodgers
Associate Dean of Arts and Sciences  Glen A. Bauer
Chair, Humanities, Social Sciences and Communication  Gonzalo Munevar
Chair, Mathematics and Computer Science  David E. Bindschadler
Chair, Natural Sciences  William G. Madden

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Chair, Engineering Technology  William L. White
Chair, Mechanical Engineering  Steven K. Howell

Dean of Management  Louis A. DeGennaro
Director, Executive Graduate Management Program  Laura A. Majewski
Director, International Management  Chin-Ling Lin

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Director, Career Services  Kevin Finn
Coordinator, Academic Achievement Center  Diana Richard
Advisor, International Student Affairs  Frank E. deHesselle
Director, Residence Life  Janelle Ostrowski
Coordinator, Residence Hall  Pamela Costello
Coordinator, Residence Hall  Laura Affer
Director Student Activities  Alan McLaughlin
Assistant Director, Student Activities  Scott A. Trudeau
Coordinator, Student Activities  Leslie Siefka-Donovan
Counselor  Brenda Hildreth
Director, Admissions  Jane T. Rohrbach
Assistant Director of Admissions  Kristi Webster
Registrar  Holly A. Diamond
Assistant Registrar  Noreen G. Naeyaert
Director of Financial Aid and Veteran Affairs  Mark A. Martin
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Director, Continuing Education and Professional Development  Victoria Navarro
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David M. Chasco
Harold Hotelling
Jane Rohrback
Mark Martin
Richard S. Maslowski

ADDITIONAL CREDIT REVIEW

Glen A. Bauer
Jane Rohrback
Richard S. Maslowski
Virginia North
Holly Diamond (ex-officio)*

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William S. Allen
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Howard Deardorff
Louis A. DeGennaro
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AIS Student Representative
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Pamela Lowry*
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Gary R. Cocozzoli
Alex DePetro
David Gregorich
Larry E. Johnson
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Dan R. Price
Patricia M. Shamamy
Loran W. Walker
Linda S. Wareck
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Student Governor President

STUDENT DISCIPLINE

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Dale Guyre
Laura L. Lisiecki
Pamela Lowry
Loran Walker
Student Representative

* Chairperson
The two years at the end of each listing indicate first, the year of initial appointment to the University faculty, and second, the year of appointment to the designated rank. The current professional engagements of guest lecturers are also shown. Current names of degree-granting institutions are used.


NEVILLE H. CLOUTEN, FR.AIA; RIBA; RA; B.Ar., 1962, University of Sydney; M.Ar., 1966, Ohio State University; Ph.D., 1968, Edinburgh University. Professor of Architecture, 1990, 1990.


LEWIS G. FRASCH, PE; B.S.M.E., 1972, Ohio State University; M.S.M.E., 1993, Iowa State University, Associate Professor of Mechanical Engineering, 1984, 1989.


DALE GYURE, B.S., 1984, Ball State University; J.D., 1989, Indiana University; M.Arch., Ph.D., University of Virginia. Assistant Professor of Architecture, 2002, 2002.


Joongsuk Kim, AICP; AIA; B.A., 1979, Hongik University, Seoul; M.A., 1984, University of Nebraska-Lincoln; Joint degree City Planning & Master of Science in Architecture, Massachusetts Institute of Technology. Ph.D. candidate, University of Michigan. Assistant Professor of Architecture, 2000, 2000.


AMILLO Y. STEVENS

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JOSEPH VERSYER, AIA, RA;

NICOLE M. VILLENEUVE,

LEWIS N. WALKER, PE;

LORAN WALKER, B.A., 1978,

PAUL XUN WANG, B.Eng.,

MELINDA WEINSTEN, B.A.,

STEVEN WELSH, B.S.B.A.,

HUBERT WHITE, RA, AIA;

DEBRA WILLIAMS, B.A.,

GLENN YEAGER, B.S.M.E.,

KINGMAN E. YEE,

JEAN YOUNES, B.S.E.E.,

EDMUND EE-MUN YUEN,

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MISSION – To provide superior undergraduate, graduate, and lifelong learning for professional achievement and civic excellence.

STUDENTS – Approximately 5,000 men and women students from throughout Michigan, the nation and the world enrolled in day and evening, credit and non-credit, on- and off-campus programs.

CAMPUS – Modern and easily accessible 120-acre campus, located in Southfield, Michigan, a progressive, suburban community. Area is home to some 200 Fortune 500 companies.

STUDENT HOUSING – Two modern Student Housing Centers accommodate some 600 students in fully furnished apartment-style suites.

STUDENT ACTIVITIES – More than 40 student clubs, professional societies, honor societies, and social fraternities and sororities. Intramural athletics and intercollegiate club sports.

ACADEMICS –
Doctor of Business Administration
Doctor of Engineering in Manufacturing Systems
Doctor of Management in Information Technology
Certificate in E Commerce
Certificate in Manufacturing Systems
Master of Architecture, professional degree
Master of Architecture, post-professional degree
Master of Science in Automotive Engineering
Master of Business Administration
Master of Business Administration (weekend)
Master of Civil Engineering
Master of Construction Engineering Management
Master of Engineering in Manufacturing Systems
Master of Engineering Management
Master of Interior Design
Master of Science Education
Master of Science in Civil Engineering
Master of Science in Computer Science
Master of Science in Electrical and Computer Engineering
Master of Science in Industrial Operations
Master of Science in Information Systems
Master of Science in Mechanical Engineering
Master of Science in Technical Communications
Bachelor of Fine Arts
Imaging
Bachelor of Science
Architecture
Business Management
Chemistry
Civil Engineering
Computer Engineering
Computer Science
Construction Management
Electrical Engineering
Engineering Technology
Environmental Chemistry
Facility Management
Humanities
Industrial Management
Information Technology
Interior Architecture
Mathematics
Mathematics and Computer Science
Mechanical Engineering
Physics
Psychology
Physics and Computer Science
Technical Communication
Technology Management
Associate of Science
Chemical Technology
Construction Engineering Technology
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University Studies

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ACCREDITATION –
The Higher Learning Commission; Member – North Central Association. The NCA accreditation report is on file in the University’s library and is available for public review by patrons. Various degree programs in architecture, interior architecture/design, illustration, management, chemistry, and engineering are additionally accredited through national professional agencies where appropriate.