The curriculum in the Master of Engineering Program is structured to provide a foundation of advanced engineering topics while allowing students flexibility to meet their specific educational objectives. The Master of Engineering requires a minimum of 30 semester hours including:

- **Program core courses** taken by all Master of Engineering students
- **Track required courses** from the discipline of interest (number of credit hours required depends upon the discipline)
- **Elective courses** depth or interdisciplinary focus depending on student educational objectives (number of credit hours available depends upon the discipline)
- **Capstone project** demonstrates applications of skills and synthesis of knowledge

### MEng Curriculum Requirements

<table>
<thead>
<tr>
<th>Program Core</th>
<th>Track Required Courses</th>
<th>Elective Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 courses (4-8 cr hrs)</td>
<td>4-5 courses (12 – 15 cr hrs)</td>
<td>1-3 courses (2-9 cr hrs)</td>
</tr>
<tr>
<td><strong>Capstone Project</strong></td>
<td>0-4 credit hours typical</td>
<td></td>
</tr>
</tbody>
</table>

### Typical Schedule for Full-Time MEng Program

<table>
<thead>
<tr>
<th></th>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Courses</strong></td>
<td>Core Course #1</td>
<td>Core Course #2</td>
</tr>
<tr>
<td><strong>Track Required Courses</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Track Course #1</td>
<td>Track Course #3</td>
</tr>
<tr>
<td></td>
<td>Track Course #2</td>
<td>Track Course #4</td>
</tr>
<tr>
<td><strong>Elective Courses</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Elect Course #1</td>
<td>Elect Course #3</td>
</tr>
<tr>
<td></td>
<td>Elect Course #2</td>
<td></td>
</tr>
<tr>
<td><strong>Capstone Project</strong></td>
<td></td>
<td>Capstone Project</td>
</tr>
<tr>
<td><strong>Credit Hours</strong></td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

<sup>1</sup> Discipline specific course  
<sup>2</sup> At the discretion of the program, student and the advisor
Core Curriculum
The core curriculum is required of all Master of Engineering students, regardless of which track they pursue. The core provides skills in the effective practice of engineering recognizing that for experienced practitioners, effectiveness includes technical skills, project and task management skills, and interpersonal skills. Students are required to take 1 course from the Project / Task Management set and 1 course from the Interpersonal set. Additional courses from these areas can be taken as elective courses.

Project / Task Management Development (1 required)
MECH6074 Quality Control Fall & Spring  On Line
ENGR6014 Eng Project Management Fall & Spring
AEEM6067 Entrepreneurship and Tech Law Spring
AEEM6099 System Eng & Analysis Spring
CVE 6044 Construction Law Fall
OM 7011 Management of Operations Fall
CS 6032 Software Testing and QA (CS majors) Fall

Interpersonal Skill Development (1 required)
ENGR6002 Management of Professionals Fall & Spring
ENGR6050 Fundamentals of Leadership Fall & Spring
CVE 6038 Leadership / Decision Making Spring
ENGR6010 Effectiveness in Tech Orgs Fall & Spring  On Line
OLHR8029 Individual Behavior in the Workplace Fall 1st half term
OLHR8084 The Diverse Workforce Fall 2nd half term
OLHR6050 Teams
OLHR 8090 Strategic Leadership Spring
MGMT7014 Leadership & Organizations

MEng Program Options
Aerospace Engineering Biomedical Engineering Chemical Engineering
Civil Engineering Computer Engineering Computer Science
Electrical Engineering Environmental Engineering
Material Science Engineering Mechanical Engineering
MEng Graduate Program Curriculum
Aerospace Engineering

The Aerospace Engineering and Engineering Mechanics Masters of Engineering degree is meant to be extremely flexible so as to meet the needs of prospective students. The coursework requirements are:

MEng Core Courses – 2 courses

Fundamental AEEM Courses - at least 4 courses selected from the following

**FALL**
- AEEM 6001  Adv Strength of Materials
- AEEM 6003  Analytical Dynamics
- AEEM 6010  Satellite Technology
- AEEM 6011  Combustion
- AEEM 6015  Modern Control
- AEEM 6041  COMP FLOW & THRMDYN
- AEEM 6076  MODEL CMPLX SYSTS
- AEEM 7027  Non-Destructive Test
- AEEM 7035  Physics of Gases
- AEEM 7050  Turbomachinery Flow
- AEEM 8030  ADVANCED PROP
- EGFD 7041  Viscous Flow and Heat Transfer
- EGFD 7051  Nu Meth Aero  Fl Mech

**SPRING**
- AEEM 6012  TURBINE COMBUSTIIION
- AEEM 6093  ADV. FLIGHT MECH.
- AEEM 6095  ASTRODYNAMICS
- AEEM 6096  FUZZY CONTROL SYS
- AEEM 6099  SYS ENG ANALYSIS
- AEEM 7028  ULTRASONIC NDE
- AEEM 7050  TURBOMACHINERY FLOW

Capstone Project – 1 course

*With permission of their advisor, students may select some of their elective credit hours in areas outside of Aerospace Engineering. Independent studies or projects in advanced topics may also be arranged.*
MEng Graduate Program Curriculum
Biomedical Engineering

**BME MEng Core Courses (one course from each category – need minimum of 6 Cr Total)**

**Project / Task Management Development Courses (1 required)**

- Advanced Medical Device Design (BME 7020) 3 F
- Medical Device Life Cycle Engineering (BME 7010) 3 S
- Quality Control (MECH 6074) 3 F, S (On Line)
- Eng Project Management (ENGR 6014) 3 F & S
- Technology Law (EGFD 6067) 3 S

**Interpersonal Skill Development Courses (1 required)**

- Management of Professionals (ENGR 6002) 3 F, S
- Fundamentals of Leadership (ENGR 6050) 3 F, S
- Effectiveness in Technical Organizations (ENGR 6010) 3 F, S (On Line)

**Advanced Technical Skill Development* (1 required)*

- Biosensors and Bioelectronics (EECE 7032) 3 A
- Biochips and Lab-On-Chips (EECE 7026) 3 S
- Nondestructive Testing (AEEM 7027) 3 F
- Biochemical Engineering (CHE 6023) 3
- Bioseparations (CHE 6050) 3
- Biomedical Microsystems (EECE 6007) 3 F
- Biomicrofluidic Systems (EECE 6078C) 4 S
- Viscous Flow and Heat Transfer (EGFD 7041) 3 F
- Turbulent Flows (EGFD 7042) 3
- Introduction to Nuclear Eng. and Health Physics (MECH 6003) 3 F
- Bio-Fluid Mechanics (MECH 6046) 3
- Applied Fast Fourier Transforms (MECH 6060) 3 F
- Acoustics (MECH 6066) 3 F
- Fundamentals of Biomechanics (MECH 6085) 3
- Advanced Biomechanics (MECH 6086) 3
- Solid Mechanics of Biological Materials (MECH 7056) 3
- Bio-Heat Transfer (MECH 7095) 3

*This requirement can be satisfied with other discipline-specific courses.

**In these course categories, the student can petition for other courses to be included, but will require approval of the MEng Advisor.

**BME MEng Track Courses (Need at least 12 cr total)**

**Medical Device Innovation & Entrepreneurship (MDIEP) Track Courses**

- Biomechanical Design of Implantable Devices (BME 7011) 3 F
- Advanced Medical Device Design (BME 7020) 3 F
- Medical Device Life Cycle Engineering (BME 7010) 3 S

Note: MDIEP Track can be combined with any of the other tracks (T/E Biomech, or Imaging)

**Tissue Engineering and Biomechanics Track Courses:**

- Joint Biomechanics and Measurement Methods (BME 6024) 3 S
- Functional Tissue Engineering (BME 6030) 3 S
Tissue Biomechanics (BME 7021) 3 F
Independent Study in Biomechanics (BME 8020) 3 F,S,U
Independent Study in Tissue Engineering (BME 8030) 3 F,S,U
Molecular and Cellular Biology (GNTD 7001) 3 F
Biomechanical and Physiological Aspects of Muscular Activity (OSE 7044C)

**Medical Imaging Track Courses:**
MR Imaging and Spectroscopy (BME 6011) 3 F
Biomedical Signal and Image Processing (BME 6012) 3 F
Biomedical Ultrasound (BME 6050) 3 S
Advanced Topics in Magnetic Resonance Imaging (BME 7012) 3
Independent Study in Medical Imaging (20 BME 8010) 3 F,S,U
Diagnostic Radiological Imaging Physics (MP 9050) 3 F

**BME MEng Electives (Need at least 6 cr total from the following)**

**General Medical Sciences Courses:**
Human Gross Anatomy (ANAT 8071C) 4-10 U
Scientific Integrity & Research Ethics (BE 7067) 1 U
Biology of Cancer (CB 8080) 3 S
Molecular and Cellular Biology (GNTD 7001) 3 F
Biochemistry and Cellular Signaling (GNTD 7002) 3 F
Human Physiology (MCP 6000) 4 F
Brain and Behavior I (NS 8041) 4-10 S
Brain and Behavior II (NS 8061) 4-10 F

**Mathematics Courses**
Biostatistics in Research (BME 7061) 3 F,S
Advanced Statistical Methods in Biomedical Res. (BME 8064) 3
Introduction to Biostatistics (BE 7022) 3 F
Computational Fluid Dynamics (EGFD 6037C) 4 S
Numerical Analysis (MATH 6006) 3 F
Partial Differential Equations and Fourier Analysis (MATH 6007) 3 S
Applied Probability and Stochastic Processes (MATH 6008) 3 F
Mathematical Programming (MATH 6015) 3 S
Applied Ordinary Differential Equations (MATH 6051) 3 S
Scientific Computation (MATH 8011) 3
Mathematical Physics (PHYS 7001) 4 F

In addition to the above courses, these can come from any graduate level engineering, science, medicine, business, or law course that is relevant to the student's career goals as determined via discussion with the Graduate Program MEng advisor, and approved accordingly by the advisor. E.g if Medical Device Innovation is chosen as the Track area combined with T/E Biomech, then electives can be selected from the Imaging Courses. All elective choices need approval of the MEng Program Director.

Note: Not all courses are taught every year. Students should use this curriculum sheet as a guide, and check Onestop prior to enrollment every semester to ensure that the course being considered is actually offered in that semester. This requires careful planning and students should start early to develop their program of study with the MEng program advisor.
2015-16 MEng Graduate Program Curriculum
Civil Engineering

A total of at least 30 semester credit hours are required for an MEng degree in Civil Engineering. Of these, 3 credit hours can be counted for the Capstone Project, if available. Students in the Civil Engineering program can choose between a targeted program that provides significant depth and a program that adds breadth within the practice of Civil Engineering. Students seeking to strengthen their area of expertise can choose either a focus on Infrastructure Design (with emphasis on Structures or Geotechnical) or on Infrastructure Systems (with emphasis on Construction, Pavements, or Transportation). Note that some courses are only offered in even years or in odd years, thus in some cases a minimum of three semesters will be necessary to fulfill all requirements.

Students who have taken any of the 600 level courses listed herein as part of their undergraduate degree at the University of Cincinnati will identify suitable substitutes in consultation with their academic advisor.

The total number of credit hours taken as independent study and/or project courses may not exceed 6.

Final Comprehensive Examination OR Capstone Project – 1 course
Take a final comprehensive examination (0 semester credit hours) OR, if available, work on a Capstone Project (3 semester credit hours) that represents the synthesis of what was learned during the formal classwork.

Civil Engineering Depth Programs – Required Classes

Option 1 - Structures
CVE 7011 Structural Mechanics   Fall
CVE 7012 Finite Element Analysis  Spring
CVE 7081 Theory and Design of Concrete Structures I  Fall 2015
CVE 7085 Metal Structures Theory and Design I  Fall 2016
CVE 7088 Structural Dynamics  Fall 2015

Option 2 - Geotechnical
CVE 7011 Structural Mechanics   Fall
CVE 7061 Consolidation and Settlement (Must have CVE 476)  TBA
CVE 7062 Soil Shear Strength and Slope Stability  TBA

Take two of the following courses:
CVE 6081 Foundation Engineering  Fall
CVE 7081 Theory and Design of Concrete Structures I  Fall 2015
CVE 7085 Metal Structures Theory  Fall 2016

In addition students must complete three of the following
CVE 6082 Reinforced Concrete Design of Shallow Foundations  Spring
CVE 6063 Principles of Pavement Engineering  Spring
GEOL 7001C Geomorphic Processes  TBA
GEOL 6004 Glacial Geology  TBA
Option 3 – Construction
CVE 6044  Construction Law  Fall
CVE 6042  Sustainable Construction and LEED  Fall
CVE 6038  Leadership and Decision Making  Spring
CVE 6036  Value Engineering and Constructability  Fall

Option 4 – Pavements
CVE 7010  Risk and Reliability  Spring
CVE 6063  Principles of Pavement Engineering  Spring
CVE 6067  Advanced Pavement Engineering  TBD

Two courses from structures, geotechnical, construction, or transportation areas.

Option 4 - Transportation
CVE 6038  Leadership and Decision Making  Spring
CVE 6022C  Traffic Control and Signal System Design  Spring 2016
CVE 6010C  Advanced Traffic Engineering, or  Fall 2015
CVE 6024  Highway Engineering and Traffic Safety  Fall 2016
CVE 6012  Travel Demand Forecasting and Environmental Analysis  Fall 2015
CVE 6008  Transportation Planning and System Evaluation  Spring 2017

Civil Engineering Breadth Program – Required Classes
CVE 7010  Risk and Reliability  TBA
Two courses from structures and/or geotechnical areas
Two courses from construction and/or traffic area

Elective Courses:
With permission of their advisor, students may select some of their elective credit hours in areas outside of Civil Engineering. Independent studies or projects in advanced topics may also be arranged, for a maximum of 6 semester credit hours total. Note that some of the courses listed below have prerequisite courses.

<p>| CVE6008 | Transportation Planning and System Evaluation |
| CVE6010C | Advanced Traffic Engineering |
| CVE6011 | Advanced Strength of Materials |
| CVE6012 | Travel Demand Forecasting and Environmental Analysis |
| CVE6021 | Bridge Engineering |
| CVE6022C | Traffic Control and Signal System Design |
| CVE6024 | Highway Engineering and Traffic Safety |
| CVE6036 | Value Engineering and Constructability |
| CVE6037 | Construction Financing &amp; Strategy Planning |
| CVE6038 | Leadership/Decision Making |
| CVE6041 | Project Management Functions |
| CVE6042 | Sustainable Construction and LEED |
| CVE6043 | Structural Systems for Constructors |
| CVE6044 | Construction Law |</p>
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE6045</td>
<td>Heavy Highway Estimating</td>
</tr>
<tr>
<td>CVE6046</td>
<td>MEP systems for Constructors</td>
</tr>
<tr>
<td>CVE6058</td>
<td>Design of Wood and Masonry Structures</td>
</tr>
<tr>
<td>CVE6063</td>
<td>Principles of Pavement Engineering</td>
</tr>
<tr>
<td>CVE6067</td>
<td>Advanced Pavement Engineering</td>
</tr>
<tr>
<td>CVE6081</td>
<td>Foundation Engineering</td>
</tr>
<tr>
<td>CVE6082</td>
<td>Reinforced Concrete Design of Shallow Foundations</td>
</tr>
<tr>
<td>CVE6085</td>
<td>Advanced Structural Analysis</td>
</tr>
<tr>
<td>CVE7010</td>
<td>Risk and Reliability</td>
</tr>
<tr>
<td>CVE7011</td>
<td>Structural Mechanics</td>
</tr>
<tr>
<td>CVE7012</td>
<td>Finite Element Analysis</td>
</tr>
<tr>
<td>CVE7013</td>
<td>Advanced Topics in Finite Element Analysis</td>
</tr>
<tr>
<td>CVE7014</td>
<td>Marketing Construction Firm</td>
</tr>
<tr>
<td>CVE7016</td>
<td>Human Resources in Construction</td>
</tr>
<tr>
<td>CVE7017</td>
<td>Operation Management in Construction</td>
</tr>
<tr>
<td>CVE7020C</td>
<td>Advanced Computer Applications in Construction Engineering and Management</td>
</tr>
<tr>
<td>CVE7021</td>
<td>International Construction</td>
</tr>
<tr>
<td>CVE7024</td>
<td>New Trends in Construction Management</td>
</tr>
<tr>
<td>CVE7061</td>
<td>Consolidation and Settlement</td>
</tr>
<tr>
<td>CVE7062</td>
<td>Soil Shear Strength and Slope Stability</td>
</tr>
<tr>
<td>CVE7074</td>
<td>Traffic Flow Theory and Network Modeling</td>
</tr>
<tr>
<td>CVE7076</td>
<td>Intelligent Transportation Systems: Integrated Planning and Technologies</td>
</tr>
<tr>
<td>CVE7081</td>
<td>Theory and Design of Concrete Structures I</td>
</tr>
<tr>
<td>CVE7082</td>
<td>Design of Concrete Structures II (CVE7081 prerequisite)</td>
</tr>
<tr>
<td>CVE7085</td>
<td>Metal Structures Theory and Design I</td>
</tr>
<tr>
<td>CVE7086</td>
<td>Metal Structures Theory and Design II (CVE 7085 prerequisite)</td>
</tr>
<tr>
<td>CVE7088</td>
<td>Structural Dynamics</td>
</tr>
<tr>
<td>CVE7089</td>
<td>Earthquake Engineering</td>
</tr>
</tbody>
</table>
**MEng Graduate Program Curriculum**  
**Chemical Engineering**

The Chemical Engineering Masters of Engineering degree is meant to be extremely flexible so as to meet the needs of prospective students. The coursework requirements are:

**MEng Core Courses – 2 courses**

**Track Required Courses – 4 courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 6040</td>
<td>Advanced Thermodynamics</td>
<td>Fall</td>
</tr>
<tr>
<td>CHE 6043</td>
<td>Adv Transport Phenomenon I</td>
<td>Fall</td>
</tr>
<tr>
<td>CHE 6044</td>
<td>Transport Phenomenon II</td>
<td>Spring</td>
</tr>
<tr>
<td>CHE 7077</td>
<td>Chemical Reactor Design</td>
<td>Spring</td>
</tr>
</tbody>
</table>

**Capstone Project – 1 course**

**Elective Courses – courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 6045C</td>
<td>Transp. Phenom Modelling &amp; Anal</td>
<td>Spring</td>
</tr>
<tr>
<td>CHE6057</td>
<td>Fuel Cells</td>
<td>Spring</td>
</tr>
<tr>
<td>CHE6059</td>
<td>Inorganic Membranes</td>
<td>Fall</td>
</tr>
<tr>
<td>CHE6076</td>
<td>Colloid Science</td>
<td>Spring</td>
</tr>
<tr>
<td>CHE6089</td>
<td>ZEOL.SYNT.CHAR.APPL</td>
<td>Fall</td>
</tr>
</tbody>
</table>

*With permission of their advisor, students may select some of their elective credit hours in areas outside of Chemical Engineering. Independent studies or projects in advanced topics may also be arranged.*
MEng Graduate Program Curriculum
Computer Engineering

The Computer Engineering Masters of Engineering degree is meant to be extremely flexible so as to meet the needs of prospective students. The coursework requirements are:

**MEng Core Courses – 2 courses**

**Track Required Courses – 3 courses**

*Computer Engineering - complete at least 3 of the following 5 courses:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE6010</td>
<td>Database Management Theory</td>
<td>Spring</td>
</tr>
<tr>
<td>EECE6029</td>
<td>Operating Systems</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6080C</td>
<td>Intro to VLSI Design</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6083</td>
<td>Compiler Theory and Practice</td>
<td>Spring</td>
</tr>
<tr>
<td>EECE7095</td>
<td>Intro to Computer Architecture</td>
<td>Fall</td>
</tr>
</tbody>
</table>

*VLIS Design Track – complete*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE6080C</td>
<td>Intro to VLSI Design</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6082C</td>
<td>VLSI Design for Test and Power</td>
<td>Spring</td>
</tr>
<tr>
<td>EECE6086C</td>
<td>VLSI Design Automation</td>
<td>Spring</td>
</tr>
</tbody>
</table>

**Capstone Project – 1 course**

**Elective Courses – courses from EECE or CS**

*With permission of their advisor, students may select some of their elective credit hours in areas outside of Computer Engineering. Independent studies or projects in advanced topics may also be arranged.*
MEng Graduate Program Curriculum
Computer Science

The Computer Science Masters of Engineering degree is meant to be extremely flexible so as to meet the needs of prospective students. The coursework requirements are:

**MEng Core Courses – 2 courses**

**Track Required Courses – 3 courses**

Computer Science Students must complete 1 course from each of the following categories:

**Algorithms and Theory:**
- CS6070 Automata
- CS 7081 Advanced Algorithms

**Systems:**
- EECE6029 Operating Systems
- CS6043 Computer Networking
- CS6097 Intro to Wireless and Mobile Networks

**Artificial Intelligence**
- CS6033 Artificial Intelligence
- CS6052 Intelligent Data Analysis
- CS6037 Machine Learning

**Capstone Project – 1 course**

**Elective Courses – courses from EECE or CS**

With permission of their advisor, students may select some of their elective credit hours in areas outside of Electrical Engineering. Independent studies or projects in advanced topics may also be arranged.
MEng Graduate Program Curriculum  
Electrical Engineering

The Master of Engineering Program for Electrical Engineering consists of three tracks: Systems, Electronic Devices, and VLSI tracks. For the track the following requirements apply:

**MEng Core Courses – 2 courses**

**Track Required Courses – 3 courses**  
*Devices and materials track - complete at least 3 of the following 5 courses:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE6007</td>
<td>Biomedical Microsystems</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6008</td>
<td>Fundamentals of MEMS</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6018</td>
<td>Microfabrication of Semiconductor Devices</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6028</td>
<td>Into to Nanoelectronics</td>
<td>Spring</td>
</tr>
<tr>
<td>EECE6048</td>
<td>Optics for Engineers</td>
<td>Fall</td>
</tr>
</tbody>
</table>

*Systems track - complete at least 3 of the following 5 courses:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE6019</td>
<td>Probability and Random Processes</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6024</td>
<td>Intro to Digital Signal Processing</td>
<td>Fall</td>
</tr>
<tr>
<td>EECE6026</td>
<td>Intro to Communication Systems</td>
<td>Spring</td>
</tr>
<tr>
<td>EECE6036</td>
<td>Intelligent Systems</td>
<td>Spring</td>
</tr>
<tr>
<td>EECE7033</td>
<td>Linear Systems Theory</td>
<td>Fall</td>
</tr>
</tbody>
</table>

**VLSI Design Track – complete**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
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<tr>
<td>EECE6086C</td>
<td>VLSI Design Automation</td>
<td>Spring</td>
</tr>
</tbody>
</table>

**Capstone Project – 1 course**

**Elective Courses – courses from EECE or CS**

*With permission of their advisor, students may select some of their elective credit hours in areas outside of Computer Engineering. Independent studies or projects in advanced topics may also be arranged.*
MEng Graduate Program Curriculum  
Environmental Engineering or Environmental Science

In order to graduate with a Master of Engineering degree with specialization in Environmental Engineering, the student has to successfully complete 30 cr hr of courses including at least 2 **Fundamental** courses and 1 **Design** course.

**MEng Core Courses (4-8 cr hr)**

**Track Required Courses (10 – 15 cr hr)**
Minimum of Two Fundamental courses and
Minimum of One Design course

**Capstone Project (1 – 4 cr hr)**

**Elective Courses (3 – 10 cr hr)**

**Fundamental Courses - at least 2 courses to be selected from the following**

**Fall Semester**
ENVE 6000/6001 Applied Biology for Engineered Systems (3/2 cr hr)
ENVE 6047 Chemical Principles of Environmental Systems (4 cr hr)
ENVE 6053 Physical Principles of Environmental Systems (4 cr hr)
BE 7022 Introduction to Biostatistics (4 cr hr)

**Spring Semester**
ENVE 6027 Mathematical Principles (4 cr hr)
ENVE 6046 Biological/Microbiological Principles of Environmental Systems (4 cr hr)

**Design Courses - at least 1 course to be selected from the following**

**Fall Semester**
ENVE 6064 Air Resources Management (3 cr hr)

**Spring Semester**
CVE 6090 Engineering Hydrology (3 cr hr)
ENVE 6054 Physical/Chemical Processes for Water Quality Control (4 cr hr)
ENVE 6055 Biological Processes for Water Quality Control (4 cr hr)

**Elective Courses**

**Fall Semester**
ENVE 6014 Solid Waste Management (3 cr hr)
ENVE 6022C Atmospheric Chemistry and Monitoring (3 cr hr)
GEOG 6071C Introduction to Geographic Information Systems (3 cr hr)
Spring Semester
ENVE 6044  Environmentally Conscious Engineering (3 cr hr)
ENVE 6052  Advanced Topics in Environmental Chemistry (3 cr hr)
ENVE 6058  Environmental Instrumentation (3 cr hr)

With permission of their advisor, students may select some of their elective credit hours in areas outside of Environmental Engineering; typical courses come from Arts & Science and DAAP. Independent studies or projects in advanced topics may also be arranged.
MEng Graduate Program Curriculum
Materials Science or Metallurgical Engineering

The Master of Engineering consists of two tracks: Materials Science or Metallurgical Engineering. For either track the following general requirements apply:

MEng Core Courses – 2 courses

Track Required Courses – 4 courses from the following

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester</th>
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</thead>
<tbody>
<tr>
<td>MTEN6010L</td>
<td>PHYS PROP SOLIDS</td>
<td>Fall</td>
</tr>
<tr>
<td>MTEN6012C</td>
<td>Nano Materials Eng</td>
<td>Spring</td>
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<tr>
<td>MTEN6013</td>
<td>Smart Structures</td>
<td>Fall</td>
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<tr>
<td>MTEN6020</td>
<td>Kinematics of Materials Proc</td>
<td>Fall</td>
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<tr>
<td>MTEN6025C</td>
<td>POLYMER PROCESSING</td>
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<tr>
<td>MTEN6034</td>
<td>Polymer Properties</td>
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<tr>
<td>MTEN6035</td>
<td>Polymer Spectroscopy</td>
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<tr>
<td>MTEN6042</td>
<td>COMPOSITE MATERIALS</td>
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<tr>
<td>MTEN6044</td>
<td>Ceramics Processing</td>
<td>Fall</td>
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<tr>
<td>MTEN6047</td>
<td>ELEC OPT PROP CER</td>
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<tr>
<td>MTEN6049</td>
<td>Mag, Diel and Sensor Properties</td>
<td>Spring</td>
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<td>MTEN6060</td>
<td>Corrosion</td>
<td>Spring</td>
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<tr>
<td>MTEN6065</td>
<td>Biomedical Materials</td>
<td>Fall</td>
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<tr>
<td>MTEN6070</td>
<td>Phase Transitions</td>
<td>Spring</td>
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<tr>
<td>MTEN6085</td>
<td>Coatings</td>
<td>Spring</td>
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<tr>
<td>MTEN6090</td>
<td>MOLECULAR MODELING</td>
<td>Spring</td>
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<tr>
<td>MTEN6096</td>
<td>Smart Materials</td>
<td>Fall</td>
</tr>
<tr>
<td>MTEN6097</td>
<td>Mech Prop Materials</td>
<td>Fall</td>
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<tr>
<td>MTEN 7010cC</td>
<td>Adv Materials Tech</td>
<td>Fall</td>
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<tr>
<td>MTEN7032</td>
<td>Polymer Analysis &amp; Char</td>
<td>Spring</td>
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<tr>
<td>MTEN7035</td>
<td>Advanced Thermodynamics</td>
<td>Fall</td>
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<tr>
<td>MTEN7048</td>
<td>DIFFRACTION THEORY</td>
<td>Spring</td>
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<tr>
<td>MTEN7079</td>
<td>DEFECT IN SOLID</td>
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<tr>
<td>MTEN7094</td>
<td>POLYMER SCIENCE</td>
<td>Fall</td>
</tr>
</tbody>
</table>

Capstone Project – 1 course

With permission of their advisor, students may select some of their elective credit hours in areas outside of Materials Science / Metallurgical Engineering. Independent studies or projects in advanced topics may also be arranged.
MEng Graduate Program Curriculum
Mechanical Engineering

The Mechanical Engineering Master of Engineering curriculum allows the flexibility for students to choose from a combination of courses to complete the Track & Elective credit hours requirement. For students who wish to specialize in a particular area, suggested courses oriented toward the available areas of specialization are given below. However, students do not need to specialize.

MEng Core Courses – 2 courses

Capstone Project – 1 course

Track / Elective Courses – 7 courses

Primary areas of specialization within Mechanical Engineering are:
• Structural Dynamics and Vibro-Acoustics
• System Dynamics and Controls
• Design and Manufacturing
• Solid Mechanics
• Thermal-Fluids Engineering

FALL
AEEM6001 Advanced Strength of Materials
MECH6013 Smart Structures
MECH6031 Intro to Robotics
MECH6046 Bio-Fluid Mechanics
MECH6050 Occupational Safety Engineering
MECH6060 Applied Fast Fourier Transforms
MECH6066 Acoustics
MECH6070 Intermediate DFM
MECH6074 Quality Control
MECH6075 Production Planning & Control
MECH6077 Micro & Nano Manufacturing
MECH6081 Modeling Materials
MECH6097 HVAC Design I
MECH7014 Adv Solid Mechanics
MECH7042 CFD for Incomp Flow
MECH7053 Adv Finite Element Methods
MECH7056 Solid Mechanics of Biological Materials
MECH7062 System Dynamic analysis
MECH7067 Roterdynamics
MECH7075 Principles of Ergonomics
MECH7090 Conduction Heat Transfer
MECH7095 Bio-heat Transfer
MECH7096 Viscous Fluid Flow
EGFD7041 Viscous Flow and Heat Transfer

SPRING (subject to change)
MECH6004 Monte Carlo Methods
MECH6011 Computational Design
MECH6023 CAD for Manufacturing
MECH6032 Robot Control and Design
MECH6035 Intelligent Systems Theory
With permission of their advisor, students may select some of their elective credit hours in areas outside of Mechanical Engineering or EGFD. Independent studies or projects in advanced topics may also be arranged.