CIVIL ENGINEERING - MASTER OF SCIENCE IN CIVIL ENGINEERING

In support of the mission and vision statements for the graduate program, the Civil Engineering Department adopts the following goals for the Master of Science (MS) degree:

1. Prepare students to fulfill the academic prerequisites specified by the Americans Society of Civil Engineers (ASCE) for Licensure and Professional Practice in Civil Engineering.
2. Prepare students to attain the Body of Knowledge specified by ASCE necessary for entry into the practice of civil engineering at the professional level.
3. Prepare students in conducting applied research in areas relevant to the practice of civil engineering.
4. Prepare students for advanced graduate studies towards a terminal degree.

Students may choose from the geotechnical, structural, or water resources engineering options, requirements of which are specified below. Exceptions to these requirements must be approved by the head of the department. Further information related to the MS degree may be found under the Academic Programs of Study (http://catalogs.nmsu.edu/nmsu/regulations-policies) section of the catalog.

Option: Geotechnical Engineering

Thesis Option

Background Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>C E 357</td>
<td>Soil Mechanics</td>
</tr>
<tr>
<td>C E 457</td>
<td>Foundation Design</td>
</tr>
<tr>
<td>GEOL 111G</td>
<td>Introductory to Geology (or higher-level courses)</td>
</tr>
<tr>
<td>C E 445</td>
<td>Reinforced Concrete Design (or higher-level courses based on ACI)</td>
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</tbody>
</table>

Core Courses

C E 506 Advanced Soil Mechanics
C E 509 Deep Foundations
C E 585 Slope Stability Analysis and Design

Optional Courses

Select two from the following: 1
C E 485 Design of Earth Dams
C E 577 Advanced Pavement Analysis
C E 581 Ground Water Hydrology

Select two from the following: 2
C E 479 Pavement Analysis and Design
C E 515 Finite Element Methods (or similar course)
C E 577 Advanced Pavement Analysis
C E 586 Geotechnical Earthquake Engineering

Select 3 credits from courses outside the area or department 3

Research Credits

C E 599 Master’s Thesis 4

Total Credits

30

Notes:
1. The optional courses outside the area or department should be previously approved by the academic advisor or student’s Graduate Committee.
2. International students must be registered at least 9 credits per semester.
3. International students may be required to take English language courses to show proficiency in English.

Total credits needed are 24 credits of coursework and 6 credits of Master’s Thesis research.

Option: Structural Engineering

Thesis Option

Background Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>C E 315</td>
<td>Structural Analysis</td>
</tr>
<tr>
<td>C E 444</td>
<td>Elements of Steel Design (based on AISC)</td>
</tr>
<tr>
<td>C E 445</td>
<td>Reinforced Concrete Design (based on ACI)</td>
</tr>
</tbody>
</table>

Core Courses

C E 501 Advanced Mechanics of Materials
C E 515 Finite Element Methods
C E 544 Advanced Design of Steel Structures
C E 545 Advanced Concrete Design
C E 571 Structural Dynamics

Optional Courses

Select three from the following: 9
C E 502 Advanced Mechanics of Steel Structures
C E 504 Advanced Engineering Design
C E 509 Deep Foundations
C E 543 Advances in Concrete Technology
C E 547 Bridge Engineering
C E 554 Wood Design
C E 555 Masonry Design
C E 572 Earthquake Engineering
### Option: Water Resources Engineering

#### Thesis Option

**Prerequisite Courses**
- Core courses: 12 credits
- Statistics: 3 credits

**Area of Interest Courses**
- C E 599: Master’s Thesis 6 credits

**Total Credits**

30 credits

### Non-Thesis Option

**Requirements**
- Core courses: 12 credits
- Statistics: 3 credits

**Area of Interest Courses**
- 15 credits

**Total Credits**

30 credits

#### Foundation Requirements

1. ABET - Accredited BS in Civil, Agricultural, Geological Engineering, or closely related field or equivalent (as per existing CAGE Department regulations)
2. One course in surface water hydrology
3. One course in hydrogeology or geohydrology
4. At least three semesters of hydraulic and hydraulic design

#### Core Courses

**Core Courses**
- C E 531: Open Channel Hydraulics
- C E 557: Water Resources Development
- C E 581: Ground Water Hydrology
- C E 582: Statistical Hydrology
- A ST 505: Statistical Inference I (or advanced statistics class if student is qualified)

**Statistics**

3 credits

**Total Credits**

15 credits

#### Area of Interest Courses (Flexible)

**Agricultural/ Civil/ Environmental Engineering**
- A EN 459: Design of Water Wells/Pumping Systems
- A EN 475: Soil and Water Conservation
- A EN 478: Irrigation and Drainage Engineering
- C E 482: Hydraulic Structures
- C E 483: Surface Water Hydrology
- C E 485: Design of Earth Dams
- C E 503: Special Design and Analysis Program
- C E 504: Advanced Engineering Design
- C E 682: Topics in Hydrodynamics II
- ENVE 557: Surface Water Quality Modeling
- ENVE 630: Fate and Transport of Environmental Contaminants
- GEOG 581: System Design for Geographic Information Science and Technology (GIS &T)
- SOIL 652: Advanced Soil Physics
- M E 530: Intermediate Fluid Mechanics
- M E 533: Computational and Theoretical Fluid Mechanics
- M E 580: Engineering Analysis II
- I E 533: Linear Programming
- I E 534: Nonlinear Programming
- I E 535: Discrete Optimization
- BLAW 527: Negotiation and Business Dispute Resolution

Approved Electives in College of Engineering: A ST, AEEC, GEOG, GEOL, MATH, STAT, and SOIL (must be approved by the Advisor and Committee Members).