CIVIL ENGINEERING, M.S.

Degree Requirements (30 Hours)

For the M.S. degree, 30 credit hours, of which 6 credit hours must be ECIV 797, are required. At least 15 hours of course work must be 700-level or higher. Up to 9 credit hours of course work may be taken outside of the department for degree credit with the approval of the student’s advisor and the graduate director. Prescribed core courses are required for each area of study (see “Core Courses” below). A maximum of 6 credits of ECIV 797 may be used toward the student’s program of study.

Credits earned in ECIV 798 do not count toward a student’s program of study.

Core Courses

Each area of study has a minimum core requirement for the M.S., M.E., and Ph.D. degrees. The core requirements in the different areas of study are as follows:

Environmental Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECIV 750</td>
<td>Principles of Environmental Engineering Process</td>
<td>3</td>
</tr>
</tbody>
</table>

Select two of the following: 6

- ECIV 555 Principles of Municipal Solid Waste Engineering
- ECIV 556 Air Pollution Control Engineering
- ECIV 558 Environmental Engineering Process Modeling
- ECIV 751 Water and Wastewater Treatment Theory I
- ECIV 752 Water and Wastewater Treatment Theory II
- ECIV 753 Unit Operations Laboratory for Water and Wastewater Treatment
- ECIV 755 Industrial Wastewater Treatment

Total Credit Hours 9

Geotechnical Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ECIV 730</td>
<td>Advanced Soil Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three of the following: 9

- ECIV 731 Slope Stability, Retaining Systems and Lateral Earth Pressure
- ECIV 732 Theoretical and Numerical Methods in Geomechanics
- ECIV 733 Physico-chemical Properties of Soils
- ECIV 734 Dynamics of Soils and Foundations
- ECIV 736 Ground Improvement Techniques
- ECIV 737 Advanced Foundation Design

Total Credit Hours 12

Structural Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ECIV 720</td>
<td>Advanced Structural Mechanics and Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Select three of the following: 9

- ECIV 722 Theory and Design of Plates and Shells
- ECIV 724 Dynamics of Structures
- ECIV 725 Advanced Analysis and Design in Structural Metals
- ECIV 726 Repair and Retrofit of Structures

Total Credit Hours 12

Transportation Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>
| Select one from each group: 9

Group One

- ECIV 535 Geotechnical Engineering in Transportation
- ECIV 540 Transportation Systems Planning
- ECIV 541 Highway Design

Group Two

- ECIV 542 Traffic Engineering
- ECIV 748 Traffic Flow Theory

Group Three

- ECIV 705 Deterministic Civil and Environmental Systems Engineering
- ECIV 706 Probabilistic Civil and Environmental Systems Engineering

Total Credit Hours 9

Water Resources Engineering

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
</table>
| Select one of the following options: 9

Option One

- Select two of the following:
  - ECIV 760 Computational Hydraulics
  - ECIV 761 Numerical Methods in Subsurface Hydrology
  - ECIV 762 Advanced Hydrology
  - ECIV 763 Unsaturated Flow Theory
  - ECIV 764 Contaminant Transport
  - ECIV 765 Erosion and Sediment Control
  - ECIV 766 Fluid Transients
  - ECIV 767 Sediment Transport and River Mechanics

Select one of the following:

- ECIV 560 Open Channel Hydraulics
- ECIV 562 Engineering Hydrology
- ECIV 563 Subsurface Hydrology

Option Two

- Select three of the following:
  - ECIV 760 Computational Hydraulics
  - ECIV 761 Numerical Methods in Subsurface Hydrology
  - ECIV 762 Advanced Hydrology
  - ECIV 763 Unsaturated Flow Theory
  - ECIV 764 Contaminant Transport
  - ECIV 765 Erosion and Sediment Control
  - ECIV 766 Fluid Transients
  - ECIV 767 Sediment Transport and River Mechanics

Total Credit Hours 9