Graduate Certificate in Engineering: 12 credits / 4 courses

Students pursuing a Graduate Certificate in Engineering must focus on one of the four of the following areas of study:

- Geotechnical and Pavements
- Structures
- Environmental and Water Resources
- Transportation

### Geotechnical and Pavements:

Students must enroll in:

- ENCE640 Advanced Soil Mechanics
- ENCE643 Theory of Soil Strength
- ENCE741 Earth Retaining Structures

And select one of the following courses:

- ENCE641 Advanced Foundations Systems
- ENCE743 Soil Dynamics and Earthquake Eng.
- ENCE745 Geoenvironmental Site Remediation

### Transportation:

Select four of the following courses:

- ENCE674 Urban Transit Planning and Rail Transport Engineering
- ENCE675 Airport Planning and Design
- ENCE677 OR Models for Transportation Systems Analysis
- ENCE681 Freight Transportation Analysis
- ENCE688 App. of OR in Transportation Systems Management

### Environmental and Water Resources:

Students must enroll in:

- ENCE630 Environmental and Water Resource Systems I

And select three of the following courses:

- ENCE635 GIS for Watershed Analysis
- ENCE650 Process Dynamics in Environmental Systems
- ENCE651 Chemistry of Natural Waters
- ENCE652 Microbial Principles of Environmental Engineering
- ENCE655 Environmental Behavior of Organic Pollutants
- ENCE688B Land-Atmosphere Interactions in Hydrology
- ENCE730 Environmental and Water Resource Systems II
- ENCE756 Bioremediation

### Structures:

Students must enroll in:

- ENCE611 Finite Element Methods
- ENCE710 Steel Structures I
- ENCE713 Concrete Structures I

And select one of the following courses:

- ENCE610 Fundamentals of Structural Analysis
- ENCE613 Structural Dynamics
- ENCE615 Structural Reliability

**NOTE:** Any courses not listed above must be approved by the Senior Academic Advisor PRIOR to registration.

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**KEY**

<table>
<thead>
<tr>
<th>Online Option *</th>
<th>(offering information)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Prerequisite course]</td>
<td>Offered in Fall 2018</td>
</tr>
</tbody>
</table>

**DISCLAIMER:** All offerings are tentative and subject to change. Updated 9/17/2018
Civil and Environmental

Student Name (Last, First): ____________________________  Student ID: ________________
Beginning Term: ________________  Anticipated Graduation: ________________

Background (Educational, Training, Career, etc.):

Objective (Career Field, Areas of Interest, etc.):

Civil and Environmental Required Core:

<table>
<thead>
<tr>
<th>Course</th>
<th>Planned Term</th>
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</thead>
<tbody>
<tr>
<td>Geotechnical and Pavements: Must enroll in: ENCE640, ENCE643, ENCE741, Choose one of the following: ENCE641, ENCE743, ENCE745</td>
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</tr>
<tr>
<td>Transportation: ENCE674, ENCE675, ENCE677, ENCE681, ENCE688</td>
<td></td>
</tr>
<tr>
<td>Structures: Must enroll in: ENCE611, ENCE710, ENCE713, Choose one of the following: ENCE610, ENCE613, ENCE615</td>
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</tr>
<tr>
<td>Environmental and Water Resources: Must enroll in: ENCE630, Select three of the following: ENCE635, ENCE652, ENCE650, ENCE651, ENCE655, ENCE688B, ENCE730, ENCE756</td>
<td></td>
</tr>
</tbody>
</table>

Comments:

NOTE: Any courses not listed above must be approved by the Senior Academic Advisor PRIOR to registration.

Student Signature  ____________________________  Date  __________
Advisor Signature  ____________________________  Date  __________