INFRASTRUCTURE SYSTEMS ENGINEERING – ISE

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<td>CE 5010</td>
<td>Introduction to GIS</td>
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(1) IS Core – Students must select four courses from the following lists or as approved by the student’s advisor. To ensure suitable breadth of knowledge, students must take at least one course from each group; that is, not all four courses can be from either Group A or Group B.

**Group A – Environmental and Water Resources Engineering**

- CE 6200  Fate and Transport Modeling of Ecosystems
- CE 6220  Water Chemistry
- CE 6230  Hydrology
- CE 6240  Groundwater Hydrology and Contaminant Transport
- CE 6260  Environmental Microbiology and Biological Waste Treatment
- SYS 6070  Environmental Systems Processes

**Group B – Transportation Engineering**

- CE 5400  Traffic Operations
- CE 6410  Introduction to Transportation Planning
- CE 6420  Public Transportation
- CE 6430  Intermodal Transportation
- CE 6440  Intelligent Transportation Systems
- CE 6450  Transportation Safety Design
- CE 6460  Introduction to Integrated Transportation Systems Models
- CE 6470  Transportation Economics
- CE 6480  Advanced Geometric Design

(2) Sustainability, Resilience, Risk, and Modeling of Infrastructure Systems (SRRM) Electives – chosen from the following or as approved by the student’s advisor:

- CE 6010  Computational Modeling in Civil Engineering
- CE 6250  Environmental Systems Modeling and Management
- CE 6490  Transportation Data Analysis and Modeling
- CE 6500  Transportation Sustainability
- ARCH 5150  Global Sustainability
- SYS 5044  Economics of Engineering
- SYS 6050  Risk Analysis
- PLAN 5620  Sustainable and Adaptive Infrastructure
- PLAN 5740  Transportation Policy and Planning
- PLAN 5830  Environmental Policy and Planning
(3) Technical Electives – chosen from any course at or above the 5xxx level in APMA, SEAS, PLAN, or EVSC. Or any technical course as approved by the CEE Chair of Graduate Studies.

(4) Pre-requisites: college math through Ordinary Differential Equations, college physics, and college chemistry; plus, Introduction to Environmental Engineering (CE 2100 or equivalent), Introduction to Geotechnical Engineering (CE 3710 or equivalent), and Transportation Infrastructure Design (CE 3400).

(5) Students may be permitted to modify this framework, pending approval of their academic advisor and the CEE Director of Graduate Studies.