

## **Civil and Environmental Engineering – Required Coursework**

*Effective Fall 2013*

Courses core to the CEE Graduate Program are specific to one of the five areas of specialization within Civil and Environmental Engineering: Environmental, Geotechnical, Structural, Transportation, and Water Resources. Students must complete the core courses in their respective area of specialization as part of their program of study in the CEE Graduate Program. The courses may be taken on the UCD campus, or their equivalent from another accredited academic institution.

### **Environmental Engineering**

- a) Students must choose either a “Water track” or an “Air track”
  - i. Students pursuing the Water track must complete ECI 243A (4 units) and ECI 243B (4 units) - Water and Waste Treatment
  - ii. Students pursuing the Air track must complete ECI 242 Air Quality (4 units) and ECI 247 Aerosols (4 units)
- \* Students in the Environmental Engineering track are encouraged to complete two quarters of Environmental and Water Resources Engineering Seminar (ECI 296)

### **Geotechnical Engineering**

- a) Students pursuing the Geotechnical Engineering track must complete ECI 281A – Advanced Soil Mechanics (4 units)
- b) In addition, students pursuing the Geotechnical Engineering track must complete two courses from the following list: ECI 259, 280A, 280B, 281B, 282, 283, 284, 286, 287, and 288 (see General Catalog for more information on these courses)
- \* Students interested in geotechnical engineering practice are strongly encouraged to take ECI 281B

### **Structural Engineering and Structural Mechanics**

Students pursuing the Structural Engineering or Structural Mechanics track must complete three of the following core courses:

- a) ECI 201 - Introduction to Theory of Elasticity (4 units)
- b) ECI 211 - Advanced Matrix Structural Analysis (4 units)
- c) ECI 212 - The Finite Element Method in Structural Mechanics (4 units)
- d) ECI 213 - Analysis of Structures Subjected to Dynamic Loads (4 units)

### **Transportation Engineering**

Students pursuing the Transportation Engineering track must complete the following core courses:

- a) ECI 251 – Transportation Demand Analysis (4 units)

- b) TTP 200 – Transportation Survey Methods (4 units)
- c) ECI 256 – Urban Traffic Management and Control (4 units)
- d) An economics course such as ECN 100, ECN 145, ECI 268, ARE 275, ARE/ESP 175, ARE 176, or a course similar in spirit (econometrics courses are normally not considered similar in spirit -- they are statistics-oriented, and can have relatively little economics content per se).
- e) TTP 281 – ITS weekly seminar series: must be taken each quarter for at least the first two years. Can be waived due to a conflict with another course, after confirmation with the Transportation Engineering Area Advisor.

Additionally, for students wishing to take ECI 162, 163, or 165 as part of their Master's Program, no more than two of these courses can be counted toward their graduate degree.

### **Water Resources Engineering**

Students pursuing the Water Resources Engineering track must complete two courses from the following list:

- a) ECI 240 - Water Quality (4 units)
- b) ECI 272A - Advanced Hydrogeology (4 units)
- c) ECI 276 - Watershed Hydrology (4 units)
- d) ECI 277A - Computational River Mechanics (4 units)
- e) ECI 279 - Advanced Mechanics of Fluids (4 units)