CEE 4320 Reinforced Concrete Design

Required Course

Catalog Description:
Lec. 2. Rec. 2. Credit 3.
Prerequisite: CEE 3320 . Design of members and structures in concrete. Design of beams, slabs, columns, and footings.

Math & Basic Sciences:	0 credits	
Engineering Topics:	3 credits	X Contains significant design
General Education:	0 credits	
Other:	0 credits	
Course Coordinator:	E. P. Ryan	
Updated:	09/10/2013	

Text Book(s) and Supplemental Material(s):
- ACI 318 – Building Code Requirements for Structural Concrete
- Jack C. McCormac, Wiley, *Design of Reinforced Concrete,* latest edition.

Course Goal(s):
The goal of CEE 4320 "Reinforced Concrete Design" is to produce students who have a basic understanding of the behavior, analysis, design, and construction of reinforced concrete structural members.

Instructional Outcomes for the Course:
Students will be expected to:
1. understand basic material properties of reinforced concrete and the behavior of reinforced concrete members;
2. understand the ultimate strength method used in reinforced concrete design;
3. understand the fundamental principles of the design and analysis of reinforced concrete structural members subjected to axial force, bending moment, shear or combinations thereof;
4. analyze and design typical reinforced concrete beams, columns, and footings using the American Concrete Institute 318 Building Code; and
5. develop an appreciation of issues involved in reinforced concrete construction.

Criterion 3 Student Outcomes addressed by this Course:
(3a) Knowledge of math, science, engineering (Level 3)
(3c) Design a system, component or process (Level 5)
(3e) Identify, formulate, and solve engineering problems (Level 5)
(3g) Effective communication (Level 2)
(3k) Techniques, skills, modern tools for engineering practice (Level 3)

Program Criteria addressed by this Course:

- Apply knowledge of math and sciences (Level 3)
- Design a system, component, or process in more than one civil engineering context (Level 5)
- Apply knowledge of four technical areas appropriate to civil engineering (Level 3)

Course Topics:

1. Material properties of reinforced concrete (8 %)
2. Design of rectangular beams, T-beams, and one-way slabs (25 %)
3. Design of beams with tensile and compressive reinforcement (8 %)
4. Design of reinforcing steel development length (10 %)
5. Design for deflection (10 %)
6. Design of shear reinforcement (12 %)
7. Column design (15 %)
8. Footing design (12 %)

Additional Topics/Assignments for dual-level (4000/5000) courses:

N/A