

1. CEE 4320 – Reinforced Concrete Design
2. Course credit hours: 3
 Contact hours per week: 4
 Credit category: Engineering Topics (Significant Design)
3. Course coordinator: R. Craig Henderson
4. Textbook: ACI 318 – Building Code Requirements for Structural Concrete

Supplemental materials: Jack C. McCormac, Wiley, *Design of Reinforced Concrete*, latest edition

5. Course information:

2020 Catalog description	Design of members and structures in concrete. Design of beams, slabs, columns, and footings.
Prerequisite(s)	CEE 3320
Course type	Required

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Understand basic material properties of reinforced concrete and the behavior of reinforced concrete members	1, 4
CO2	Understand the ultimate strength method used in reinforced concrete design	1
CO3	Understand the fundamental principles of the design and analysis of reinforced concrete structural members subjected to axial force, bending moment, shear or combinations thereof	1, 2
CO4	Analyze and design typical reinforced concrete beams, columns, and footings using the American Concrete Institute 318 Building Code	1, 2
CO5	Develop an appreciation of issues involved in reinforced concrete construction	4

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

3.4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
-----	--

7. 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 %)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
2. Analyze and solve problems in at least four technical areas appropriate to civil engineering
3. Design a system, component, or process in at least two civil engineering contexts

8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:

N/A

9. Date: 01/20/2020