

1. **Course number and name**
CE 3345 Design of Concrete Structures
2. **Credits and contact hours**
3 credit hours; 3 lecture hours
3. **Instructor's or course coordinator's name**
Dr. Reza Ashtiani
4. **Text book: title, author, and year**
Design of Reinforced Concrete; Jack C. McCormac and Russell H. Brown, 10th Edition, Wiley, 2015
 - a. **Other supplemental materials**
ACI 318-14, "Building Code Requirements for Reinforced Concrete" (Code and Commentary), American Concrete Institute, Detroit, MI.
ASCE Standard 7-10, "Minimum Design Loads for Buildings and Other Structures", American Society of Civil Engineers. Reinforced Concrete: Mechanics and Design; James Wight, 7th Edition, Pearson, 2015. Lecture note, lecture slides, class handouts, laboratory procedures, and other supplemental materials posted on class website.
5. **Specific course information**
 - a. **Description:**
A study of framed structures, trusses, girders, and beams including applications of static and moving loads on bridges.
 - Prerequisites or co-requisites:**
CE2343 Structural Analysis with a C or better
 - c. **Indicate whether a required, elective, or selected elective course**
Required
6. **Specific goals for the course**
 - a. **Specific outcomes of instruction**
At the end of this course, the student will be able to apply the theory of reinforced concrete to calculate the flexural strength of beams, design single and doubly reinforced rectangular beams, design and analysis of T-Beams, design of one-way slabs, concepts in serviceability, and the analysis and design of columns. The most current ACI 318 code will be utilized as the primary reference to familiarize the students with the latest developments in the analysis and design of reinforced concrete structures.
7. **Student outcomes are addressed by the course:** a, e, h, k, 1, 2, 3, 4
8. **Topics to be covered**
 1. *Introduction to Reinforced Concrete*
 2. *Mechanical Properties of Concrete*
 3. *Flexural Analysis of Beams*
 4. *Strength Analysis of Beams According to ACI Code*
 5. *Design of Rectangular Beams and One-Way Slabs*
 6. *Analysis and Design of T Beams*
 7. *Analysis and Design of Doubly Reinforced Beams*
 8. *Serviceability*
 9. *Shear Considerations*
 10. *Introduction to Columns*
 11. *Design of Short Columns*