

Course	CE 47800 – Design of Concrete Structures
Type of Course	Required for Civil Engineering Program. Formally CE 376.
Catalog Description	Flexural analysis and design of reinforced concrete beams including singly and doubly reinforced rectangular beams and T-beams, shear and diagonal tension, serviceability, bond, anchorage and development length, short and slender columns, slabs, footings, and retaining walls, including computer applications.
Credits	3
Contact Hours	3
Prerequisite Courses	CE 31500, CE 37500
Corequisite Courses	None
Prerequisites by Topics	Civil Engineering Materials, Structural Analysis
Textbook	H. Nilson, D. Darwin, and C. Dolan, <i>Design of Concrete Structures, 14th Edition</i> , McGraw Hill Publishing Company, 2004.
Supplemental Materials	ACI 318-05 Building Code Requirements for Structural Concrete and Commentary, 2005.
Course Objectives	To introduce the students to the fundamentals of reinforced concrete design with emphasis on the design of rectangular and T beams, short and slender columns, slabs, and footings and foundations. In addition, student will learn how to analyze and design reinforced concrete structural members under bending, shear, and/or axial loads according to the ACI building code requirements (including computer applications).

Course Outcomes	<p>Students who successfully complete this course will be able to:</p> <ol style="list-style-type: none"> Identify and compute the main mechanical properties of concrete and steel. (1) Identify and calculate the design loads and distribution. (2) Apply the strength method to design R.C. structural members. (2) Analyze and design R.C. beams for flexure and shear. (2, 4) Analyze and design short and slender R.C. columns. (2, 4) Analyze and design R.C. slabs. (2, 4) Analyze and design R.C. footings. (2, 4) Apply relevant ACI Code provisions to ensure safety and serviceability of structural elements. (2, 4) Utilize computational software packages for the analysis and design of concrete structures. (1, 2, 6)
Lecture Topics	<ol style="list-style-type: none"> Introduction to Engineering Design, Loads, and Design Codes Flexural Analysis and Design of Beams Shear and Diagonal Tension in Beams Serviceability Short and Slender Columns One and Two Way Slabs Footings and Foundations
Computer Usage	Moderate
Laboratory Experience	None
Design Experience	High
Coordinator	Salah Sarhat, Ph.D.
Date	1 July 2018