*1. Course number and name*

**ENGR 425: Reinforced Structures**

*2. Credits, contact hours, and categorization of credits in Table 5-1 (math and basic science, engineering topic, and/or other).*   
3 credits; two 75-minute lectures or three 50-minute lectures per week; engineering topic

*3. Instructor’s or course coordinator’s name*

Chris Wenshen Pong

*4. Text book, title, author, and year*

McCormac, Jack C. and Brown, Russell H., Design of Reinforced Concrete, 10th Edition, Wiley, 2016, ISBN-13: 978-1-118-87910-8

*5. Specific course information*

*a. brief description of the content of the course (catalog description)*

Design of reinforced concrete structural systems. Elements of systems include beams, slabs, columns, footing and connections. Emphasizes Ultimate Strength approach to safety and serviceability considering bending, shear, and axial loads. The mechanics of reinforced concrete. Material behavior of reinforced concrete. Principles of design process of reinforced concrete structures. Design Building Codes, specifically ACI Code.

*b. prerequisites or co-requisites*

ENGR 323 Structural Analysis or can be taken currently

*c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program*

Required for Civil Engineering program.

*6. Specific goals for the course*

*a. specific outcomes of instruction (e.g. The student will be able to explain the significance of current research about a particular topic.)*

* The student will demonstrate basic understanding and knowledge of Reinforced Concrete material properties;
* The student will demonstrate basic understanding and knowledge of Load and Resistance Factor Design (LRFD) principle;
* The student will demonstrate basic understanding and knowledge of American Concrete Institute (ACI-318) design code;
* The student will demonstrate the ability to perform basic design of the Reinforced Concrete members.

*b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

ABET student outcomes: 1, 2, 4, 7

*7. Brief list of topics to be covered*

* Structural Design Process and Principles.
* Reinforced Concrete Behaviors and Properties.
* Flexure: Beams
* Flexure: T Beams
* Shear in Beams
* Development, Anchorage, and Splicing of Reinforcement
* Serviceability
* Continuous Beams
* One-way Slabs
* Columns: Combined Axial Load and Bending
* Footings