CE 413 – Advanced Reinforced Concrete Design

Code and Name: CE 413 – Advanced Reinforced Concrete Design
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Reinforced Concrete – Mechanics and Design : .K. Wight and J.G. MacGregor., 6th Edition, Pearson, 2012

Other References:
- *Building Code Requirements for Structural Concrete (ACI 318M-11)*
- *Course handouts: distributed on a regular basis to provide more information on the topic.*

Course Description:
Study of the strength, behaviour, and design of two way slab systems using direct design and equivalent frame methods, design of continuous beams and slender columns, design for torsion; behaviour and design of lateral load resisting systems (moment frames and shear walls); design of combined footings, drawing typical plans and sections of RC structures.

Pre-requisites: CE313 Reinforced Concrete Design
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (From Fall 2019-SOs: 1-7)

1. Recognize the impact of economy and safety in the design of RC structures elements like slabs and columns (4)
2. Design reinforced concrete columns (2)
3. Design reinforced concrete two way slabs and combined footing (2)
4. Design reinforced concrete retaining walls (2)
5. Design torsion in reinforced concrete elements (2)
6. Design shear walls in the reinforced concrete buildings (2)
7. Develop computational tools to facilitate the design process (1)

Topics to be covered:
- Recognize various structural forms of reinforced concrete structures
- Using computational tools as excel to formulate the design process of RC elements
- Analyze and design reinforced concrete Two-way slabs, flat plate slabs, long columns and combined footings according to the limit state design method.
- Prepare design sketches (plan, elevation, sections etc.) to convey design information.
- Appreciate the impact of concrete structures on sustainable design and professional responsibility of proper design and construction of these structures.

Grading Policy:
The grading for the course is: 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes for the remaining 20%.