This course explores advanced topics in the design of reinforced concrete structures. Topics covered include: moment-curvature of beams, two-way slab systems, slender columns, strengthening using FRP reinforcement, and strut-and-tie models. Pre-requisite: CE341

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Office Hours: Tuesday 1:30-3:30 pm
Thursday 1:30-3:30 pm
or by appointment

Course Objectives:
- To develop an understanding of the principles governing the behavior of reinforced concrete members.
- To explore advance topics in the design of reinforced concrete structures.
- To apply the principles learned in the course on the development of specific design problems.

Textbooks:

ACI 318-02 Building Code and Commentary.


Written Assignments: The instructor will define the due date for assignments which are to be handled by the students at the beginning of the respective class.
Late assignments will be penalized at 20% off per day. Topic and deadlines will be defined during class.

**Exams:**

Two hourly exams will be held during the class period. Dates are indicated below; please plan your schedule accordingly. Make-up exams will NOT be given. Prior consent must be given for any missed exam, and will only be allowed in extreme cases.

*Exam Schedule:*

Exam 1. October 14, 11:15 AM, 223 Thomas
Exam 2. November 18, 11:15 AM, 223 Thomas
Final Exam. December 13-17 (see schedule online)

**Evaluation Methods:**

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<tr>
<th>Evaluation Method</th>
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<tr>
<td>1. First exam</td>
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<td>2. Second exam</td>
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<td>3. Assignments</td>
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<td>4. Final exam</td>
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**COURSE OUTLINE**

1. Introduction.

2. Two-way slab systems: design by flexure (ACI Direct Design Method); shear; shear-moment transfer; deflections.

3. Design of spandrel beams: Torsion, shear and flexure.

4. Design of slender columns.

5. Moment-curvature relationship for beams

6. Flexural strengthening of RC beams with composites laminates.

7. Strut-and-Tie models