Course: *CIV_ENV 325, Reinforced Concrete Design, Winter 2011*

Credits: 1 Unit credit; contact hours: 3 hrs lecture

Instructor: David Corr


Other Mat'l: ACI 318 and ASCE 7 are optional; pertinent portions of these codes are provided to students who do not elect to purchase them.

Description: Rational basis of structural design. Mechanical behavior of steel, concrete, and the resulting composite. Design approach for reinforced concrete components of a building system.

Prerequisite: CIV_ENV 221

Required?: Required

Goals: By the end of the course, students should be able to:

1) Describe the requirements of a properly designed reinforced concrete structure
2) Describe the methodologies that govern strength design
3) Complete bending moment design of a flexural element.
4) Complete shear design of a flexural element.
5) Complete design of a beam-column using interaction relationships
6) Complete a limited reinforced concrete structural system design
7) Conduct team-based design project
8) Prepare written and oral reports on design project outcomes

Relation of “course specific goals” to programmatic student learning outcome through Course Assessment Table (CAT), which feeds into Program Assessment Table (PAT)

<table>
<thead>
<tr>
<th>Course Goals</th>
<th>Outcome</th>
<th>Assessment via</th>
<th>Performance Indicator</th>
<th>Assessment</th>
<th>Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>a</td>
<td>Exam</td>
<td>Final, Prob. 1</td>
<td>96%&gt;65%</td>
<td>Strong performance. Perhaps consider more challenging exam problems (although exam time is a problem)</td>
</tr>
<tr>
<td>4</td>
<td>Exam</td>
<td>Final, Prob. 2</td>
<td>93%&gt;65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Exam</td>
<td>Final, Prob. 3</td>
<td>96%&gt;65%</td>
<td></td>
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</tbody>
</table>

| 1            | c       | Exam           | Midterm, Prob. 3      | 100%>65%   | Goal #2 is weakest of all exam results - emphasize this more in subsequent years. |
| 2            | Exam    | Final, Prob. 5 | 70%>65%               |            |                |

| 7            | d       | Project        | Overall Score         | 100%>70%   | Project was relatively short due to time crunch in this class. Start earlier in quarter and require more. Consider adding a lab session to this course |

| 6            | e       | Project        | Technical Score       | 100%>70%   | See above. |

| 8            | g       | Project        | Written & Presentation Scores | 90%>70%    | Writing was at times inadequate. Emphasize writing skills in future years. |
## Topics Covered:

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topics</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 3, 5, 7</td>
<td>Introduction, Design Concepts</td>
<td>Ch. 1 &amp; 2</td>
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<tr>
<td></td>
<td></td>
<td>Limit States, Loads, Factors of Safety</td>
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<tr>
<td>2</td>
<td>Jan 10, 12, 14</td>
<td>Material Properties, Flexural Theory</td>
<td>Ch. 3, Ch. 4-1 to 4-8</td>
</tr>
<tr>
<td>3</td>
<td>Jan 17</td>
<td>NO LECTURE - MLK DAY</td>
<td></td>
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<tr>
<td></td>
<td>Jan 19, 21</td>
<td>Flexural Theory &amp; Design</td>
<td>Ch. 5</td>
</tr>
<tr>
<td>4</td>
<td>Jan 24, 26, 28</td>
<td>Flexural Design, Shear Design</td>
<td>Ch. 6-1 to 6-5</td>
</tr>
<tr>
<td>5</td>
<td>Jan 31, Feb 2, 4</td>
<td>Shear &amp; Torsion Design</td>
<td>TBD</td>
</tr>
<tr>
<td>6</td>
<td>Feb 7</td>
<td>MIDTERM EXAM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feb 9, 11</td>
<td>Development &amp; Anchorage</td>
<td>Ch. 8-1 to 8-6</td>
</tr>
<tr>
<td>7</td>
<td>Feb 14, 16, 18</td>
<td>Serviceability</td>
<td>Ch. 9-1 to 9-5</td>
</tr>
<tr>
<td>8</td>
<td>Feb 21, 23, 25</td>
<td>Columns: Combined Axial &amp; Flexure</td>
<td>Ch. 11, Ch. 12-1 to 12-2</td>
</tr>
<tr>
<td>9</td>
<td>Feb 28, Mar 2, 4</td>
<td>Floor Systems, Foundations</td>
<td>Ch. 15-1 to 15-5</td>
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<tr>
<td>10</td>
<td>Mar 7, 9</td>
<td>Design Project Presentations</td>
<td></td>
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<tr>
<td></td>
<td>Mar 11</td>
<td>Final Exam Review</td>
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</tbody>
</table>

Monday 3/14, 9-11am FINAL EXAM

## Grade Distribution:

**Homework 20%**
Weekly homework, due *in class* on Wednesdays.

**Midterm 20%**
1.5 hour midterm exam Monday February 7.

**Design Project 30%**
Multi-week design project, culminating in presentations at the end of the quarter.

**Final Exam 30%**
Two hour final exam scheduled for Monday March 14, 9-11am.

## Contact Information:
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