


<p>College of Engineering</p> <p>Department of Civil Engineering</p>	 <p>جامعة الملك سعود King Saud University 1957</p>												
<h2>CE 370 Reinforced Concrete Design -1</h2>													
<p>Credit and Contact hours</p>	<p>4/ 4 (Lectures), 1 (Tutorials), 0 (Laboratory)</p>												
<p>Required, or Elective</p>	<p>Required for a BSCE degree</p>												
<p>Course Description</p>	<p>Introduction to reinforced concrete members and structures, building codes, overview of SBC and ACI codes, the design process, limit states and the design of reinforced concrete, load factors and load combinations in SBC, loadings and actions. Material properties of concrete and reinforcing steel. Flexural behavior of reinforced concrete beams. Analysis and design of beams for flexure and shear in accordance with strength design method of SBC-304. Bond, development length of reinforcement and splices. Analysis and design of continuous beams and one-way floor systems (one way solid and joist slabs). Analysis and design of short columns. Analysis and design of spread footings.</p>												
<p>Prerequisites or Co-requisites</p>	<p>Properties and Testing of Structural Materials (CE 306) and Structural Analysis -1 (CE 360)</p>												
<p>Course Learning Outcomes</p>	<p>Students completing this course successfully will be able to</p> <table border="1" data-bbox="470 1243 1428 2016"> <thead> <tr> <th data-bbox="470 1243 1236 1321">Course Learning Outcomes</th> <th data-bbox="1236 1243 1428 1321">Related Student Outcomes (SO)</th> </tr> </thead> <tbody> <tr> <td data-bbox="470 1321 1236 1512">CLO1. Design rectangular beams, T beams and doubly reinforced beams for flexure and shear according to strength design method considering safety and economy</td> <td data-bbox="1236 1321 1428 1512">SO2</td> </tr> <tr> <td data-bbox="470 1512 1236 1646">CLO2. Determine the strength of existing rectangular beams, T beams and doubly reinforced beams to evaluate their safety and load-carrying capacity.</td> <td data-bbox="1236 1512 1428 1646">SO4</td> </tr> <tr> <td data-bbox="470 1646 1236 1758">CLO3. Compute tensile and compressive development lengths of steel reinforcing bars embedded in concrete.</td> <td data-bbox="1236 1646 1428 1758">SO2</td> </tr> <tr> <td data-bbox="470 1758 1236 1937">CLO4. Design real life concrete elements such as continuous beams, one-way slabs, short columns and spread footing considering reinforcement detailing, safety and economy.</td> <td data-bbox="1236 1758 1428 1937">SO2</td> </tr> <tr> <td data-bbox="470 1937 1236 2016">CLO5. Determine the strength of existing continuous beams, one-way slabs, short columns and spread</td> <td data-bbox="1236 1937 1428 2016">SO4</td> </tr> </tbody> </table>	Course Learning Outcomes	Related Student Outcomes (SO)	CLO1. Design rectangular beams, T beams and doubly reinforced beams for flexure and shear according to strength design method considering safety and economy	SO2	CLO2. Determine the strength of existing rectangular beams, T beams and doubly reinforced beams to evaluate their safety and load-carrying capacity.	SO4	CLO3. Compute tensile and compressive development lengths of steel reinforcing bars embedded in concrete.	SO2	CLO4. Design real life concrete elements such as continuous beams, one-way slabs, short columns and spread footing considering reinforcement detailing, safety and economy.	SO2	CLO5. Determine the strength of existing continuous beams, one-way slabs, short columns and spread	SO4
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Student Outcomes related to this Course	<p>SO2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.</p> <p>SO4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.</p>																	
Topics Covered	<table border="1"> <thead> <tr> <th>List of Topics</th> <th>Related CLOs</th> </tr> </thead> <tbody> <tr> <td>1. Introduction, Limit states, Design process</td> <td>CLO1</td> </tr> <tr> <td>2. Material properties (concrete and steel bars)</td> <td>CLO1</td> </tr> <tr> <td>3. Design of rectangular, T, and doubly reinforced beams for flexure and shear</td> <td>CLO1</td> </tr> <tr> <td>4. Strength of rectangular, T beams and doubly reinforced beams in flexure and shear.</td> <td>CLO2</td> </tr> <tr> <td>5. Bond and development length.</td> <td>CLO3</td> </tr> <tr> <td>6. Design of different concrete elements; continuous beams, one-way slabs, short columns, and spread footing</td> <td>CLO4</td> </tr> <tr> <td>7. Strength of different concrete elements; continuous beams, one-way slabs, short columns, and spread footing</td> <td>CLO5</td> </tr> </tbody> </table>	List of Topics	Related CLOs	1. Introduction, Limit states, Design process	CLO1	2. Material properties (concrete and steel bars)	CLO1	3. Design of rectangular, T, and doubly reinforced beams for flexure and shear	CLO1	4. Strength of rectangular, T beams and doubly reinforced beams in flexure and shear.	CLO2	5. Bond and development length.	CLO3	6. Design of different concrete elements; continuous beams, one-way slabs, short columns, and spread footing	CLO4	7. Strength of different concrete elements; continuous beams, one-way slabs, short columns, and spread footing	CLO5	
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Textbook(s) and Other Required Material	James K. Wight, James G. Macgregor. Reinforced concrete, Mechanics and Design. Fifth Edition, Pearson Prentice Hall, USA.																	
Grading System	Two Mid-term Exams 50 % Quizzes and assignments 10% Final Exam: 40%																	
Instructors	Prof. Mohammad Al-Shannag (2A31), email; mjshannag@ksu.edu.sa Dr. Abdulrahman Albidah (2A52), email; aalbidah@ksu.edu.sa Dr. Aref Abadel (2A79), email; aabadel@ksu.edu.sa																	
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