

CE 579 Special Topics in Structural Engineering

Credit and Contact hours	3 / 3 (Lectures), 0 (Tutorials), 0 (Laboratory)														
Required, or Elective	Elective														
Course Description	This course deals with special topics in structural engineering which are of contemporary interest.														
Prerequisites or Co-requisites	None														
Course Learning Outcomes	<p>Students completing this course successfully will be able to:</p> <table> <thead> <tr> <th>Course Learning Outcomes (CLOs)</th><th>Related Student Outcomes (SO)</th></tr> </thead> <tbody> <tr> <td>CLO1. Acquire new knowledge about selected topics in Structural Engineering. K1</td><td>SO1</td></tr> <tr> <td>CLO2. Solve advanced Civil Engineering problems, S1</td><td>SO2</td></tr> <tr> <td>CLO3. Carry out a group-project related to the state-of-the-art analysis and design for advanced applications. S1</td><td>SO2</td></tr> <tr> <td>CLO4. Evaluate the current state-of-the-art methods of structural analysis and design for advanced applications. V1</td><td>SO6</td></tr> <tr> <td>CLO5. Produce Scientific-writing research reports on selected topics. V1</td><td>SO6</td></tr> <tr> <td>CLO6. Design of advanced structural systems and evaluate its performance. V2</td><td>SO7</td></tr> </tbody> </table>	Course Learning Outcomes (CLOs)	Related Student Outcomes (SO)	CLO1. Acquire new knowledge about selected topics in Structural Engineering. K1	SO1	CLO2. Solve advanced Civil Engineering problems, S1	SO2	CLO3. Carry out a group-project related to the state-of-the-art analysis and design for advanced applications. S1	SO2	CLO4. Evaluate the current state-of-the-art methods of structural analysis and design for advanced applications. V1	SO6	CLO5. Produce Scientific-writing research reports on selected topics. V1	SO6	CLO6. Design of advanced structural systems and evaluate its performance. V2	SO7
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Student Outcomes related to this Course	<p>SO 1 Recognize advanced engineering knowledge, concepts, and techniques to identify, interpret, and analyze complex and real-life engineering problems.</p> <p>SO 2 Provide solutions for complex and real-life engineering problems through critical thinking and the use of modern engineering tools, and identify their impact on social, global, cultural, environmental, safety, and economic factors.</p> <p>SO 6 Demonstrate scientific integrity, ethical responsibility, and academic values in scientific publications, research projects, and thesis work.</p> <p>SO 7 Effectively manage, individually or in groups, specialized tasks and activities in coursework, projects, assignments, and research work with a high level of autonomy and responsibility.</p>														
Topics Covered	<table> <thead> <tr> <th>List of Topics</th><th>Related CLOs</th></tr> </thead> <tbody> <tr> <td>Topics may be selected (6 to 7) from the following but not limited to these topics:</td><td></td></tr> </tbody> </table>	List of Topics	Related CLOs	Topics may be selected (6 to 7) from the following but not limited to these topics:											
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	<ol style="list-style-type: none"> 1. Topic #1: Strengthening of RC members 2. Topic #2: Concrete-filled steel tubular (CFST) members 3. Topic #3: Optimization in structural engineering 4. Topic #4: Utilization of waste materials in the production of concrete 5. Topic #5: Methods of demolition of high-rise buildings and special structures 6. Topic #6: Structural design and construction aspects of nuclear power plants (NPP) 7. Topic #7: Mix design and properties of ultra-high performance concrete 8. Topic #8: Prediction of service life of RC / steel structures 9. Topic #9: Life cycle assessment of concrete/steel buildings 10. Topic #10: Design aspects of fallout shelters 11. Topic #11: Performance of different types of mechanical couplers used for splicing steel rebars in RC 	CLO 1, 2, 3, 4, 5, 6
Textbook(s) and Other Required Material	• None	
Grading System	Assignments and Home-works Presentation – 1 Presentation – 2 Presentation – 3 Mini project – 1 (Final Exam) Mini project – 2 (Final Exam)	30% 10% 10% 10% 20% 20%
Instructors	Prof Yousef Al Salloum, Office 2A9, email: ysalloum@ksu.edu.sa	
Date of Review	March, 2025	