



Jordan University of Science and Technology
Faculty of Engineering
Civil Engineering Department

CE919 Advanced Behavior Of Reinforced Concrete Structures - JNQF Level: 6

Second Semester 2024-2025

Course Catalog

3 Credit Hours. Unified Theory of Concrete Structures develops an integrated theory encompassing the various stress states experienced by RC structures under the various loading conditions of bending, axial load, shear, and torsion. Upon synthesis, the new rational theories replace the many empirical formulas currently used for shear, torsion, and membrane stress. The unified theory is divided into six model components: a) the struts-and-ties model, b) the equilibrium (plasticity) truss model, c) the Bernoulli compatibility truss model, d) the Mohr compatibility truss model, e) the softened truss model, and f) the softened membrane model.

Teaching Method: On Campus

Text Book

Title	Hsu, T. T., & Mo, Y. L. (2010). Unified theory of concrete structures. John Wiley & Sons.
Author(s)	John Wiley & Sons
Edition	1st Edition
Short Name	Ref#1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	Wight, J.K. (2016). Reinforced Concrete: Mechanics and Design, 7th Edition. Pearson Education, Inc., Upper Saddle River, New Jersey.	Pearson Education, Inc., Upper Saddle River, New Jersey.	7th Edition	
Ref#3	ACI Committee 318 (2019). Building code requirements for structural concrete (ACI 318-19), and commentary (ACI 318R-19). American Concrete Institute, Farmington Hills.	American Concrete Institute, Farmington Hills.	19th Edition	

Class Schedule & Room

Section 1:
 Lecture Time: U :-
 Room:

Tentative List of Topics Covered

Weeks	Topic	References
Weeks 1, 2	Introduction	From Ref#1 , From Ref#2 , From Ref#3
Weeks 3, 4	Equilibrium (Plasticity) Truss Model.	From Ref#1
Weeks 5, 6, 7	Bending and Axial Loads.	From Ref#1
Weeks 8, 9	Fundamentals of Shear.	From Ref#1 , From Ref#3
Weeks 10, 11	Rotating Angle Shear Theories	From Ref#1 , From Ref#3
Weeks 12, 13	Fixed Angle Shear Theories	From Ref#1 , From Ref#3
Weeks 12, 13	Fixed Angle Shear Theories	From Ref#1 , From Ref#3
Weeks 14, 15	Torsion	From Ref#1 , From Ref#3
Weeks 15, 16	Strut and Tie Model.	From Ref#2 , From Ref#3

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Identify the principles and methods of equilibrium (Plasticity) Truss Model, bending and Axial Loads, fundamentals of Shear, and rotating Angle Shear Theories [50L6K1]	50%	
Identify the principles and methods of fixed Angle Shear Theories, torsion, and strut and tie model [50L6K2]	50%	

Relationship to NQF Outcomes (Out of 100%)

L6K1	L6K2
50	50

Evaluation

Assessment Tool	Weight
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Mid-Exam	50%
Final Exam	50%

Policy	
Plagiarism	<p>Plagiarism is a serious academic offense. Plagiarism is the use of someone else's ideas, words, projects, artwork, phrasing, sentence structure or other work without properly acknowledging the ownership (source) of the property (item). Plagiarism is dishonest because it misrepresents the work of someone else as one's own. It is intellectual theft as it robs others of credit for their work. Plagiarism takes many forms including:</p> <p>? Using someone else's words without putting those words in quotation marks and providing full information about their source, sufficient information so that another person could easily locate the words that are being quoted, whether it is in an article, a book, or on the web.</p> <p>? Using unique, original ideas, phrases, sentences, paragraphs, or other materials, etc. from a single source or a variety of sources such as a text, journal, web page, electronic source, design, artwork, etc. in one's work without citing all sources. For a student found plagiarizing, the punishment will be a failing grade in the assignment without the right to redo the assignment up to a failing grade in the course.</p>
Assignments	University policy is that assignments are due on the date assigned. Instructors may refuse to accept late assignments or lower the grade that would be otherwise given
Attendance	<p>University policy is that students are to attend all classes and to arrive on time. Verified emergencies may require an absence or delay, but habitual tardiness or absence affects your learning and disrupts the class. Your presence is important since student contributions are a significant part of classroom activity and absence deprives others of your contributions.</p> <p>According to current University Regulations for attendance,</p> <p>Student with 2 absences: receives 5% warning</p> <p>Student with 3 absences: receives 10% warning</p> <p>Student with 5 absences: receives 20% and fails the course</p>
Mobile Phones	All mobile phones, pagers and/or other communication devices should be turned off before entering the classroom
Diversity and the Use of English	English is the common language of the JUST campus, the use of which includes everyone. It is the only language to be used in the classroom. JUST brings together students and faculty from diverse cultural and linguistic backgrounds, which is one of the strengths of the university. This diversity provides an opportunity to share our different experiences and enlarge our understanding of the world.

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