

Zarqa University



Faculty of Engineering Technology
Department: Civil Engineering
Course title: Structural Analysis 1
(0902343)

Prerequisite: Mechanics of Materials
(0905213)

Instructor: Eng. Hana' Al-Ghanim
Lecture's time: 10-11, 9:30-12
Semester: Spring, 2016/2017
Office Hours: Sun., Tu., Th.: 12-1
Mon., Wed.: 11-12:30

Course description:

An introduction to the basic principles of structural analysis considering the analysis of statically determinate structures. The course covers the classical methods for analysis of statically determinate structures.

Aims of the course:

1. This course is intended to provide civil engineering students with a clear understanding of the theory and application of structural analysis.
2. To introduce civil engineering students to the different structural systems, their function and behavior.
3. Application of structural analysis to the different structures including: trusses, beams, frames, cables and arches.
4. Emphasis is placed on the analysis of statically determinate structures with reference to indeterminate structures and degree of indeterminacy.
5. The classical methods for the analysis are presented.

Intended Learning Outcomes (ILOs):

Successful completion of this course should lead to the following learning outcomes:

1. Understand the presenting of real structures by idealized structural systems and idealizations of support reactions.
2. Distinguish between the different structural components and systems, types of determinate structures (beams, trusses, frames, cables and caches), the types of forces they carry as well as the methods applied to their analysis.
3. Demonstrate the ability to analyze the different for internal forces and support reactions.
4. Understand how to construct the shear force and bending moment diagrams of different beams and frames' members.
5. Demonstrate the ability to draw the influence lines of statically determinate beams and trusses and to determine the maximum values of certain functions due to different types of moving loads.
6. Understand the deformations of structures under loading and be able to calculate the deflections in beams, trusses, and frames using conventional and energy methods.
7. Develop that ability of selecting the appropriate technique of solution to a given structural problem.



Course structures:

Week	C. Hrs	ILOs	Topics	Teaching Procedure	Assessment methods
1	3	1, 2	Introduction to Structural Analysis: Types of Structures Types of Loading Types of Supports	Lecture notes presented through slide projector and whiteboard, solving examples and problems	Regularly asking questions.
2	3	1, 2	Idealized Structures: Equations of Equilibrium Determinacy and Stability	Lecture notes presented through slide projector and whiteboard, solving examples and problems	Asking the student to solve the problems on white board guiding him when required, HW1.
3-4	6	3, 7	Plane Trusses Method of Joints Method of Section	Lecture notes presented through slide projector and whiteboard, solving examples and problems	HW2
5-7	9	3, 4, 7	Beams and frames: Shear equation and diagram Moment equation and diagram	Lecture notes presented through slide projector and whiteboard, solving examples and problems	HW3, HW4, Quiz, 1 st Exam
8-9	6	5,7	Influence lines for beams and trusses: Moving concentrated and distributed loads	Lecture notes presented through slide projector and whiteboard, solving examples and problems	HW5, Quiz
10	3	3	Cables and Arches	Lecture notes presented through slide projector and whiteboard, solving examples and problems	HW6, 2 ^{ed} Exam
11-13	9	6, 7	Deflections: Direct integration Moment area theorems Conjugate beams	Lecture notes presented through slide projector and whiteboard, solving examples and problems	HW7, Quiz
14-15	6	6, 7	Deflections using energy methods: Virtual Work Method	Lecture notes presented through slide projector and whiteboard, solving examples and problems	HW8, Quiz, Final Exam

References:

“Structural Analysis” by R. C. Hibbeler, 9th Edition, PrenticeHall, 2014 .

Assessment Methods:

Methods	Grade	Date
HWs	4	Bi-weekly
Quizes	7	Bi-weekly
1 st Exam	20	10/4/2017
2 nd Exam	20	9/5/2017
Final Exam	50	TBD





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الإصدار: 01

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