

**Salahaddin University - Erbil**  
**College of engineering - Civil Department**

Module Name	Structural Analysis		Code	1122
Course Status	Core	Duration:	15 week – one semester	Credit point 5
Pre-requisites	Mechanics of materials	Total Work Load	135 hr	Class Attendance 60 hr Self Studies 75 hr
Course Description	This course covers the following topics: loads and its effects on structures, load combinations, structural analysis of determinate beams, trusses and frames, deflections of determinate beams by moment area and conjugate beam methods, as well as calculations of deformations in determinate trusses, beams, and frames. The course also provides solutions of indeterminate structures by using the method of superposition.			
Course Objectives	<p>This course concerns with the study of the theory and application of structural analysis as it applies to trusses, beams, and frames. Emphasis is placed on developing the student's ability to both model and analyze a structure and to provide realistic applications encountered in professional practice. The goals include:</p> <ol style="list-style-type: none"> <li>1. Discussion of some of the preliminary aspects of structural analysis, and analysis of the most common form of structure that the engineer may encounter in professional practice.</li> <li>2. Analysis of cables, arches, and statically determinate trusses, beams, and frames; and calculation of elastic deflections using double integration, geometric and energy methods.</li> <li>3. Analysis of statically indeterminate trusses, beams, and frames using approximate, force and moment distribution methods; and construction of influence lines for statically determinate and indeterminate problems.</li> </ol>			
Learning Outcome	<p>At the end of the course, students will have the ability to:</p> <ol style="list-style-type: none"> <li>1. Know the basic types of structures, their components, and supports, and identify the various types of loads that are considered for an appropriate analysis and design.</li> <li>2. Choose an appropriate analytical model for a structure, discuss the determinacy and stability of structures and analyze statically determinate, planar, pin-connected structures, cables and three-hinged arches.</li> <li>3. Draw shear force and bending moment diagrams for frames using superposition method, the influence lines for statically determinate and indeterminate structures, and analyze statically indeterminate trusses and frames using approximate methods, force and displacement/ moment distribution methods.</li> <li>4. Solve elastic deflection problems using method of double integration, moment area theorem, conjugate beam and energy methods (principle of virtual work and Castigliano's theorem).</li> </ol>			
Literature & text Books	STRUCTURAL ANALYSIS TENTH EDITION SI UNIT R. C. HIBBELER			
Type of Teaching	Theory Lectures	Tutorial	Practical	
	3 hr	1 hr	0 hr	
Evaluation Profile	Students are required to do first midterm exam on 8 week, class room activities, quizzes, home works and final exam on week 15th. So that the final grade will be based upon the following criteria:			
	Course period efforts (out of 40%)	Midterm Exam (90 min written exam at week 8)		20 %
		Short exams (Quiz) at least 2 during the course period (one of them must be before week 8)		10 %
		assignments and home works at least 2 during the course period		6 %
		Class Room Activities, Reports and Seminars		4 %
	-----		----	
Course period efforts (out of 60%)	Written exam (120 min written exam week 15)		60 %	
	-----		----	