

Structural Analysis Module				
Course Title	Theory of Structures			
Course Code	CEng2082			
Program	B.Sc in Water Resources and Irrigation Engineering			
Module name	Structural analysis			
Module Coordinator	Name: Office location Mobile:; e-mail: Consultation Hours: _____			
Instructor Name	Name: Office location Mobile:; e-mail: Consultation Hours: _____			
Course Information	Academic Year : Year: II Semester : II Meeting Day: To be arranged at the beginning of the semester Meeting Time: To be arranged at the beginning of the semester Meeting Location: To be arranged at the beginning of the semester			
ECTS	5			
Students' work load in hrs	L	T	L/P	Home study
	2	2	0	4
Course Objectives and Competences Acquired	The aim of this particular course is to enable students with the theoretical knowledge of stability Requirements and determinacy of structures. Students are able to analyze different types of loads on structures and deflections of structures, can state different theories and theorems of deflections and can differentiate between determinate and indeterminate structures and their analysis after attending this course.			
Course Description	Stability and statically determinacy of structures. Loads on structures: dead, live, impact, wind, seismic and other loads. Deflection of structures. Arches: three hinged, two hinged, and hinge-less arches. Castiglione's theorems; Maxiwell-Betti law of reciprocal deflections. Principle of minimum strain energy. Special methods for the analysis of indeterminate structures: Method of consistent deformation and least work; slope-deflection method; moment distribution and Kani's distribution. Matrix methods of structural analysis. Influence lines for determinate and indeterminate structures.			
Pre-requisite	Strength of Materials			
Course status	Core			
Schedule/ syllabus				
Week	Topics and contact hours (Lecture, Tutorial, lab/practical time allocation)			
	1.Loads on Structures 2.1 Dead loads, Live loads, Impact loads 2.2 Wind and Seismic loads			
	2.Stability and Determinacy of structures 3.1 External, internal and total Indeterminacy 3.2 External and internal stability 3.3 Methods of finding deflection and rotation			

	3.Deflections of Structures 4.1 Method of virtual work 4.2 Castiglione’s theorem 4.3 Williot-mohr diagram 4.4 Maxwell-Betti Law of reciprocal deflection		
	4.Analysis of Statically Indeterminate Structures 4.1 Method of consistent deformation and least work 4.2 slope-deflection method; 4.3 Moment distribution 4.4 Kani’s distribution 4.5 Matrix methods of structural analysis. 4.6 Influence lines for determinate and indeterminate structures. 4.7 Metrics method of structural analysis		
	5.Archs 5.1 Three hinged 5.2 Two hinged 5.3 Hinge-less arches		
Summary of Teaching and Learning Method	Lecture, tutorials, discussion, individual work, problem solving, project work		
Assessment	Percentage mark and type of assessment	Chapter or topics and date	
	10% Test = Chapter 1,2&3 20% Quizzes = All Chapter 20% assignments = Chapter 2,3,4&5 10% project work 40% Final-exam = Chapters 4,5&6		
Course Expectation	Preparedness and participation: both students and the teacher should be prepared since education is an interactive process. Students should be active participants in the teaching-learning process. They should be interested to the course and come to class with the necessary materials such as exercise books and pen. In addition, they should to take responsibility in their education. Teachers are also expected be prepared and interested to the course, which they are offering. They have to consult the essential materials ahead of time and try share their knowledge in an efficient and effective manner. Material availability: reference materials are expected to be available in the library nearest to respective faculties.		
Policy	Attendance: students should attend at least 85% Lecture and 100% laboratory or practical. Assignments: all students must do all the assignments given Tests/quizzes: all students must site/take all tests/quizzes given Cheating/plagiarism: cheating/plagiarism is strictly forbidden. It will result in disqualification of the course.		
Reference	• Temoshenko, S., (1945). Theory of structures, McGraw-Hill Company, New York. • Structural Analysis; 3rd edition, Aslamkassimali • Statically Indeterminate Structural Analysis; NegussieTebedge (Proff.) • Structural Analysis; 5th Edition, R.C. Hibbeler • Basic Structural analysis; 2nd edition, C.S. Reddy		