Faculty of Engineering & Technology

Structural Mechanics 4

Information :

Course Code :	SCM 415	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Structural Engineering & Construction Management

Instructor Information :

Title	Name	Office hours
Lecturer	Dina Muhammad Fathy Ors	38
Lecturer	Dina Muhammad Fathy Ors	38
Lecturer	Dina Muhammad Fathy Ors	38
Teaching Assistant	Sarah Salah Sayed Hussein Aly Elsheshtawy	4
Teaching Assistant	Sarah Salah Sayed Hussein Aly Elsheshtawy	4
Teaching Assistant	Sarah Salah Sayed Hussein Aly Elsheshtawy	4
Teaching Assistant	Ahmed Taher Abdelhamed Mohamed Yousef	5

Area Of Study :

At the end of this course, students will be able to:
1. To understand the instability Phenomenon in both individual members and out plane frames 2. To apply the plastic theory of analysis on plane beams and frames to realize the physical difference between elastic and plastic behavior of these structures
3. To apply a suitable approximate analysis on statically indeterminate plane structures as a primary step to determine preliminary dimensions for its elements.
4. To understand the structural behavior of thin walled shell structures and the difference between the nature of stresses developed in these structures and ordinary framed ones.

Description :

Elastic buckling of columns and beam columns, Stresses in circular plates under ax symmetric normal loads, Stresses in rectangular plates, Membrane stresses in shells of revolution and cylindrical shells.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Understand basic concepts of structural modeling
2 -	Identify techniques of solving different types of statically indeterminate structures in both elastic and plastic zones of its behavior
b.Intellectual Skills: :	
1 -	Analyze the engineering problems.
2 -	Understand the real behavior of structures
3 -	Derive different solution for engineering problems
4 -	Assess the obtained results accuracy.

c.Professional and Practical Skills: :	
1 -	Ability to handle different types of structure
2 -	Ability to handle different methods of structural analysis
3 -	Apply knowledge of mathematics, science and engineering
d.General and Transferable Skills: :	
1 -	Manage time and meet deadlines

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Elastic Buckling of columns and beam columns	15	9	6
Plastic analysis of structures (Limit analysis of plane beams and frames)	30	18	12
Approximate analysis of statically indeterminate structures	15	9	6
Membrane stresses in shells of revolution and cylindrical shells	15	9	6

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final Exams	40.00		
First Mid Term Exam	25.00		
Performance	10.00		
Second Mid Term Exam	25.00		

Course Notes :

Lecture Notes

Recommended books :

R.C. Coates, M.G. Coutie, and F.K.Cong "Structural Analysis" 3rd Edition 1987, ELBS (UK)
W.T. Marshall and H.M. Nelson "Structures", 2nd Edition 1984, ELBS (UK)
V.N. Vazirani, and M.M. Ratwani, "Advanced Theory of Structures and Matrix Methods" 6Th Edition 2008, KHANNA Publishers, Delhi.