CE-857 Theory of Plates and Shells

Code	Credit Hours	Category
CE-857	3 Credit Hours	Elective

Course Description:

This course provides an in-depth study of the theory and analysis of plates and shells, which are fundamental components in many engineering structures. It covers both classical and modern approaches to the analysis and design of these elements.

Text Book:

Timoshenko, S. P., and Woinowsky-Krieger, S. (1959), "Theory of Plates and Shells," McGraw-Hill.

Reference Books:

- Ansel C. Ugural (1981), "Stresses in Plates and Shells," McGraw-Hill.
- J. N. Reddy (2007), "Theory and Analysis of Elastic Plates and Shells," CRC Press.
- Elementary Theory of Elastic Plates, by Jaeger
- Theory and Analysis of Plates, by Szilard
- Stresses in Shells, by Wilhelm Flugge
- Introduction to Shell Structures, by Michele Melaragno
- Theory and Analysis of Elastic Plates and Shells, by J. N. Reddy

Prerequisites:

BE (Civil, Architecture, Construction Engineering & Management).

Assessment System

Component	Weightage	Frequency
Quizzes	10-15%	2-3
Assignments	10-20%	2-3
Mid Terms	30-35%	1
ESE	40-50%	1
Project (optional)	10-15%	1

Teaching Plan:

Week No	Topic
1	Introduction to Elasticity, plane stress and plane strain
2	Two dimensional problems in rectangular coordinates
3	Pure bending of plates
4	Small deflections of laterally loaded plates
5	Simply supported rectangular plates. Navier solution
6	Plates on Elastic foundation
7	Structural action and assumptions in thin-shell theory
8	Shell of Revolution
9	**Mid Term Exam/ OHT, (As per NUST Exam Policy)**
10	Shell of Revolution under axis symmetric loads
11	Bending theory of shells
12	Cylindrical shell roofs
13-14	Spherical shells
15	Shallow shells of arbitrary shapes
16	Design of Thin Concrete Shells (ACI 318.2R-14)
17	Construction of shells of various curvatures
18	**ESE**