THEORY AND DESIGN OF PLATES AND SHELLS

Course Code: 13CE2213 **L P C**
4 0 3

Course Outcomes:
At the end of the course, the student will be able to:
CO1 : Analyse isotropic rectangular and circular plates with different boundary conditions.
CO2 : Analyse the orthotropic plate using energy methods.
CO3 : Analyse the plates resting on elastic foundations.
CO4 : Analyse and design shell structures
CO5 : Analyse and design folded plates.

UNIT – I
Plate equation in Cartesian and polar co-ordinates for Isotropic plates, Analysis of rectangular and circular plates with different boundary conditions and loadings.
UNIT – II
Energy methods in Analysis of plates - Orthotropic plates
UNIT – III
Plates on elastic foundation.
UNIT – IV
Classification of shells - Membrane and bending theory for singly curved and doubly curved shells - Various approximations Design of cylindrical shells, hyperbolic paraboloidal shells, conoids
UNIT – V
Analysis of folded plates - Design of diaphragms

TEXT BOOKS

1. Timoshenko, S. and Wernewsky, *"Theory of plates and shells",* 2nd Edition, Kriegar, 1961.
2. Ramaswamy, G.S., *"Design and Construction of Shells"*, 1st Edition, Mc Graw Hill, 1999.

REFERENCES

1. Flugge, W., *"Stresses in shells",* 2nd Edition, Springer, 2000.
2. Varghee P.C., *"Design of Reinforced Concrete shells and folded plates,* 1st Edition, PHI Publishers, November, 2011.
3. Bandgopadhayag J.N. *"Tier shall Structures", classical and modern analysis",* 1st Edition, New age International (P) Ltd., reprint 2008.

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BRIDGE ENGINEERING
(Elective – II)

Course Code: 13CE 2214

L	P	C
4	0	3

Course Outcomes:

At the end of the course, the student will be able to:

CO1 : Discuss the IRC standard live loads and design the deck slab type bridges

CO2 : Analyse the box culverts for the given loading and detail the box culverts.

CO3 : Design and detail of T-Beam bridges.

CO4 : Design and check the stability of piers and abutments

CO5 : Discuss the bridge foundations and prepare the bar bending schedule.

UNIT-I

GENERAL CONSIDERATIONS FOR ROAD BRIDGES: Introduction – Site selection – Soil exploration for site – Selection of bridge type – Economical span – Number of spans – Determination of HFL – General arrangement drawing.

STANDARD SPECIFICATIONS FOR ROAD BRIDGES:

Width of carriageway- Clearances- Loads to be considered- Dead load – I.R.C. standard live loads- Impact effect- Review of I.R.C. loadings- Application of live loads on deck slabs – Wind load – Longitudinal forces- Centrifugal forces- Horizontal forces due to water currents – Buoyancy effect- Earth pressure.

UNIT-II