

ST5005 THEORY OF PLATES

DETAILED SYLLABUS

OBJECTIVE

To study the behaviour and analysis of thin plates and the behaviour of anisotropic and thick plates.

UNIT I INTRODUCTION TO PLATES THEORY

Thin Plates with small deflection. Laterally loaded thin plates, governing differential equation, various boundary conditions.

UNIT II RECTANGULAR PLATES

Rectangular plates. Simply supported rectangular plates, Navier solution and Levy's method, Rectangular plates with various edge conditions, plates on elastic foundation. Moody's chart (for analysis of plates with various boundary conditions/loading)

UNIT III CIRCULAR PLATES

Symmetrical bending of circular plates.

UNIT IV SPECIAL AND APPROXIMATE METHODS

Energy methods, Finite difference and Finite element methods.

UNIT V ANISOTROPIC PLATES AND THICK PLATES

Orthotropic plates and grids, moderately thick plates.

REFERENCES

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4. Chandrashekhara, K. Theory of Plates, University Press (India) Ltd., Hyderabad, 2001.
5. Reddy J N, "Theory and Analysis of Elastic Plates and Shells", McGraw Hill Book Company, 2006.
6. Szilard, R., "Theory and Analysis of Plates – classical and numerical methods, Prentice Hall Inc., 2004.
7. Timoshenko.S.P, and Krieger S.W. "Theory of Plates and Shells", McGraw Hill Book Company, New York, 2003.