

ME326 Pressure Vessels and Piping Technology

L	T	P	Credit	Area		CWS	PRS	MTE	ETE	PRE
3	0/1	2/0	4	DEC/GEC		15/25	25	20/25	40/50	-

Objective: To enable the students to understand the fundamentals of dilation of pressure vessels, thick cylinder and thick sphere and stress concentration about a circular and an elliptical opening. To understand fatigue and fatigue life prediction.

Syllabus		Contact Hours
Unit-1	Stresses in pressure vessels Membrane stresses, dilation of pressure vessels, thick cylinder and thick sphere, bending of plate, discontinuity stresses in pressure vessels, thermal stresses.	8
Unit-2	Factors influencing the design of pressure vessels Design criterion of elliptical, hemispherical, conical, Autofrettage.	8
Unit-3	Design of pressure vessel components such as shells, heads, nozzles, flanges as per ASME and IS codes Localised stresses, stress concentration about a circular and an elliptical opening, theory of reinforced openings, nozzle reinforcement, welded joints.	8
Unit-4	Fracture Control Fatigue of various components of pressure vessels, Fatigue life prediction, thermal stress fatigue, criteria for design with defects.	7
Unit-5	Piping elements, Dynamic analysis of piping	5
Unit-6	Use of FEM softwares for stress calculations	6
	Total	42

Reference Book:

1	Pressure vessel design by Harvey J. F., CBS Publication, ISBN- 812391041X.
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Course Outcomes

CO1	Analyse thin plates and shells for various types of stresses.
CO2	Design shells, end closures and nozzles of pressure vessels using ASME codes.
CO3	Analyse piping systems.
CO4	Ability to design internal pressure vessels and external pressure vessels
CO5	Ability to design special vessels and various parts of vessels
CO6	Knowledge of equipment fabrication and testing methods

CO-PO/PSO Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	2	1	0	1	0	0	3	3	2	2
CO2	2	3	3	2	1	1	0	1	2	0	2	2	2	2	2
CO3	2	2	2	3	1	1	0	0	0	0	0	3	3	1	1
CO4	3	3	3	3	2	2	1	0	1	0	0	3	3	2	2
CO5	2	3	3	2	1	1	0	1	2	0	2	2	2	2	2
CO6	2	2	2	3	1	1	0	0	0	0	0	3	3	1	1