

COURSE CODE	COURSE TITLE	L	T	P	C
1154AE206	STRUCTURAL HEALTH MONITORING	2	0	2	3

UNIT I: INTRODUCTION TO SHM

L – 6

An Overview of Structural Health Monitoring- SHM versus Non Destructive Evaluation- SHM using Magnetostrictive Sensors-Delamination Sensing using Magnetostrictive Sensory Layer - SHM using Optical Fibres.

UNIT II: BASICS OF SOLID MECHANICS

L – 6

Introduction - stress, strain-types of beams with various loading cases-symmetrical bending stress formulae; bar and 2D truss analysis.

UNIT III: SINGLE DEGREE OF FREEDOM SYSTEMS

L – 6

Introduction to Vibrations – Natural frequency and mode shape of single degree of freedom system-Vibration Control for SHM.

UNIT IV: STRAIN GAUGES AND SENSORS

L – 6

Construction and Working principle of Piezo resistive and resistance type strain gauges-Analysis of structures using rosettes- SHM Technologies using Piezo Sensors- Delamination Sensing using PiezoSensory Layer.

UNIT V: APPLICATION OF SHM

L – 6

Applications of structural health monitoring in aerospace structures, civil infrastructures, rotating machinery - Emerging SHM Technologies using Piezo Sensors.

Total hours: 30

List of experiments:

1. Installation of strain gauges, sensors on structures.
2. Damage Diagnostic on various types of beam using electrical strain gauge.
3. Natural frequency and mode shape for single degree of freedom system.
4. Natural frequency and mode shape for Cantilever beam.
5. Fatigue life assessment of a material.
6. Study of SHM – Wind Turbines

Total hours:30