Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research
Name of the Faculty member : Dr. Ashwani Verma (Assistant Professor)
Discipline : Mechanical Engineering
Semester : 7th
Subject : NON-DESTRUCTIVE TESTING (MEO-405 A)
Lesson Plan Duration : 15 weeks (from October 2021 to January 2022)
Work Load : L-3 T-0 P-0

Week	Theory		Practical	
	Lecture day	Topic (including assignment/test)	Practical day	Topic
1st	1st	UNIT-I **Introduction to NDT:** NDT vs destructive testing, overview of the non-destructive,	1st	
	2nd	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT (Visual Inspection)		
	3rd	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT (Liquid Penetrant testing)		
2nd	4th	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT(Magnetic Particle Testing)	2nd	
	5th	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT (Thermography Testing)		
	6th	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT (Eddy Current Testing)		
3rd	7th	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT (Ultrasonic Testing)	3rd	
	8th	Testing methods for the detection of manufacturing defects as well as material characterization, relative merits and limitations, various physical characteristics of materials and their applications in NDT (Accoustic Emission Testing)		
	9th	visual inspection – unaided and aided		
4th	10th	UNIT-II **Surface NDE methods:** Liquid penetrant testing – principles.	4th	
	11th	Testing procedure, interpretation of results.		
	12th	Types and properties of liquid penetrants.		
5th	13th	Types and properties of developers.	5th	
	14th	Advantages and limitations of various methods.		
	15th	Advantages and limitations of various methods.		
6th	16th	Magnetic particle testing.	6th	
	17th	Theory of magnetism.		
	18th	Inspection materials.		

7th	19th	Magnetization methods, residual magnetism.	7th	
	20th	Principles and methods of demagnetization.		
	21st	Interpretation and evaluation of test indications.		
8th	22nd	UNIT-III **Thermography and eddy current testing (ET):** Thermography- principles.	8th	
	23rd	Contact and non-contact inspection methods.		
	24th	Techniques for applying liquid crystals.		
9th	25th	Advantages and limitations.	9th	
	26th	Infrared radiation and infrared detectors.		
	27th	Instrumentations and methods, applications.		
10th	28th	Eddy current testing - properties of eddy currents.	10th	
	29th	Generation of eddy currents.		
	30th	Types of arrangements, advantages, limitations.		
11th	31st	Instrumentation, probes.	11th	
	32nd	Eddy current sensing elements.		
	33rd	Evaluation and interpretation, Applications.		
12th	34th	UNIT-IV **Ultrasonic testing (UT) and acoustic emission (AE):** Ultrasonic testing -principle.	12th	
	35th	Transmission and pulse-echo method.		
	36th	Instrumentation, transducers.		
13th	37th	Transducers.	13th	
	38th	Straight beam.		
	39th	Angle beam.		
14th	40th	Time of flight diffraction.	14th	
	41st	Phased array ultrasound.		
	42nd	Data representation, A/Scan, B-scan, C-scan.		
15th	43rd	Acoustic emission technique–principle.	15th	
	44th	AE parameters.		
	45th	Applications.		

(Signature of the teacher concerned with date)