

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	Non-Destructive Testing		
Course Code	PR 621	No. of Credits	3
Department	Production Engineering	Faculty	Dr.A.Raja
Pre-requisites Course Code	-		
Course Coordinator(s) (if, applicable)	-		
Other Course Teacher(s)/Tutor(s) E-mail	drrajawri@gmail.com	Telephone No.	9442521283
Course Type	Core course	× Elective course	
COURSE OVERVIEW <input type="checkbox"/>			
<p>Today modern Nondestructive tests are used in fabrication, manufacturing and in-service inspections to ensure product integrity and reliability, to control manufacturing processes, lower production costs and to maintain a uniform quality level. During construction, NDT is used to ensure the quality of materials and joining processes during the fabrication and erection phases, and in-service NDT inspections are used to ensure that the products in use continue to have the integrity necessary to ensure their usefulness and the safety of the public.</p> <p>This course enables students to understand various NDT methods and select suitable methods for different applications.</p>			
COURSE OBJECTIVES			
<ul style="list-style-type: none"> • Select appropriate non-destructive techniques • Apply surface modification techniques • Compare the merits of various non-destructive techniques 			

COURSE OUTCOMES (CO)			
Course Outcomes			Aligned Programme Outcomes (PO)
1. Select appropriate non-destructive techniques 2. Apply surface modification techniques 3. Compare the merits of various non-destructive techniques			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week	Topic	Mode of Delivery
1	1	Visual Inspection : Fundamentals of Visual Inspection - metallic materials, raw materials and welds - Inspection objectives, inspection checkpoints, sampling plan, inspection pattern etc.	PPT
2	2	Classification of indications for acceptance criteria - Codes, Standards and Specifications (ASME, ASTM, AWS etc.)-Capabilities, Limitation and Applications	PPT
3	3	Liquid Penetrant Testing: Principles - types and properties of liquid penetrants - developers	PPT
4	4	Advantages and limitations of various methods - Control and measurement of penetrant process variables - Limitation and Applications	PPT
Descriptive Assessment-1			
5	5	Magnetic Particle Testing: Theory of magnetism - ferromagnetic, Paramagnetic materials	PPT
6	6	Advantages - Circular magnetisation techniques, Limitation and Applications	PPT
7	7	Ultrasonic Inspection Methods, Equipment/Materials: Principle of pulse echo method, through transmission method, resonance method	PPT

8	8	Advantages, limitations - Focussing Techniques (SAFT), Time of Flight Diffraction (TOFD), Signal Analysis. Capabilities, Limitation and Applications	PPT	
9	9	Thermography Techniques	PPT	
Descriptive Assessment-2				
10	10	Characterization: X-ray Diffraction(XRD) - SEM, Photoluminescence(PL)	PPT	
11	11	Raman Spectroscopy, UV-Vis-IR Spectrophotometer -AFM.	PPT	
COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Descriptive Assessment-1	End of 4 weeks	1 hour	20%
2	Descriptive Assessment-2	End of 9 weeks	1 hour	20%
3	In class Assignment	End of 11 weeks	1 hour	10%
4	Descriptive Semester Exam	End of semester	3 hours	50%
ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc				
1. American Metals Society, "Non-Destructive Examination and Quality Control!"Metals Hand Book, Vol. I 7, 9th Ed, Metals Park, OH, 1989.				
2. Krautkramer, Josef and Hebert Krautkramer, "Ultrasonic Testing of Materials", 3rd Ed, Newyork, Springer-verlag, 1983.				
3. A. Goswami, "Thin film fundamentals", New age international (P) Ltd. Publishers, New Delhi, 1996. 4. Birchan, D, "Non Destructive Testing", Oxford University Press, 1977.				

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

Course Exit survey will be collected at the end of the semester before the start of semester examination through online. Students can log in their MIS account to give the feedback. Mid-semester anonymous feedback shall be collected to improve the teaching-learning process. Apart from this, students can share feedback during class committee meetings.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

- Attending classes regularly and continuously is required for the students to understand the concepts.
- Attendance will be taken in every class. If the student is not able to maintain 75% attendance, he/she is required to write the compensation assessment and obtain a minimum of 50% marks to become eligible to write the final assessment.
- Participation in the discussions is mandatory during the regular classes.
- Strict academic disciplines have to be maintained inside the class room.
- If any student is not able to attend any of the continuous assessments (1 or 2) due to genuine reason, student is permitted to attend the compensation assessment with 20 % weightage.
- Reassessment shall be conducted for failed / absented (in final assessment) in the beginning of next session. Failed (in final assessment) candidates shall get a maximum of E grade in the reassessment.

ADDITIONAL COURSE INFORMATION

eg.: The Course Coordinator is available for consultation at times that are displayed on the coordinator's office notice board. Queries may also be emailed to the Course Coordinator directly at drjawri@gmail.com.

FOR SENATE'S CONSIDERATION

Course Faculty  CC-Chairperson  HOD 