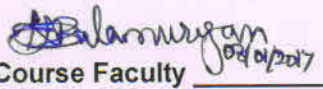




**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

<b>Course Title</b>	FRACTURE MECHANICS AND FAILURES OF MATERIALS		
<b>Course Code</b>	PH614	<b>No. of Credits</b>	3
<b>Department</b>	Physics	<b>Faculty</b>	Dr. K. Balamurugan
<b>Pre-requisites Course Code</b>	-NIL-		
<b>Course Coordinator(s) (if, applicable)</b>	Dr. N. Gopalakrishnan		
<b>Course Teacher(s)/Tutor(s) E-mail</b>	kbala@nitt.edu	<b>Telephone No.</b>	809 805 4567
<b>Course Type</b>	Core course	<input checked="" type="checkbox"/> Elective course	
<b>COURSE OVERVIEW</b>			
This course deals with various types of fractures of materials, mechanics of fractures, fatigue and corrosion failures etc. The last unit deals with failure analysis.			
<b>COURSE OBJECTIVES</b>			
This introductory course is aimed to obtain exposure to the concepts of failure mechanism of materials on structural application. Also to provide a valuable roadmap for investigating, analyzing and solving current materials failure issues preventing mechanisms.			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>		<b>Aligned Programme Outcomes (PO)</b>	
<ol style="list-style-type: none"> <li>Find the life assessment of engineering materials and analyze various factors affecting fatigues and corrosion etc.</li> <li>Provide suitable remedial measure to prevent premature failure and reduction in performance.</li> <li>Describe the failure modes and root cause of the materials failure based on fracture mechanics and fractography approach.</li> </ol>		Knowledge and understanding on the mechanism of fracture / failures of materials useful for non-destructive evaluation.	
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>S.No.</b>	<b>Week</b>	<b>Topic</b>	<b>Mode of Teaching</b>
1	1-3	(i) Motivation for the course (ii) Basics of fracture of materials and types	Chalk & talk / ppt Chalk & talk / ppt
	4-6	Linear elastic fracture mechanics (LEFM)	Chalk & talk / ppt
	7-9	Elastic plastic fracture mechanics	Chalk & talk / ppt
	10-12	Fatigue of materials and Corrosion failures	Chalk & talk / ppt and assignment
	13-15	Failure analysis	Students seminar classes

<b>COURSE ASSESSMENT METHODS</b>				
<b>S.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Test 1	6 <sup>th</sup> week	1 hour	20%
2	Test 2	9 <sup>th</sup> week	1 hour	20%
3	Assignment	12 <sup>th</sup> week	-	5%
4	Seminar	14 – 15 <sup>th</sup> week	Topic dependent	5%
5	Final Examination	NITT's schedule	3 Hours	50%
<b>ESSENTIAL READINGS : Textbooks, reference books, website addresses, journals, etc</b>				
<b>Text Books &amp; Reference Books::</b>				
1. George E. Dieter, Mechanical Metallurgy, Mc-Graw Hill (1988).				
2. Prashant Kumar, Elements of Fracture Mechanics, Wheeler Publishing (1999).				
3. Philip A. Schweitzer, Fundamentals of Corrosion, CRC Press (2010).				
<b>COURSE EXIT SURVEY</b>				
Feedback from the student after completing the course: on knowledge gained in the subjects relevant to the course, methodology adopted and aspects for improvement. Whether the topics fulfil the course outcome and program outcome.				
<b>COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)</b>				
<b>Minimum mark to pass the course:</b>				
(i) The minimum mark required to pass the course is 40 in total of continuous assessment (two tests, one assignment, and one seminar) and final examination.				
(ii) It is also necessary to score minimum in 15 mark in the final examination, irrespective of the total obtained in the continuous assessment.				
(iii) Up on not fulfilling the required combination for minimum total mark to pass the course, only F grade will be given. Further, the student(s) should go through the procedure(s) defined by the institute to pass the course.				
<b>Attendance:</b>				
(i) It is mandatory to have a min. of 75% attendance to appear in the final examination.				
(ii) Student(s) having less 75% attendance will be prevented for final examination.				
(iii) 25% of attendance has been already relaxed considering any sickness, family ceremony / festivals and academic / sport activities or any industrial visits etc.				
(iv) The relaxation on the attendance is considered only for a max. of 5% to fulfill the 75% requirement for those with original / genuine reasons on medical grounds.				
<b>ADDITIONAL COURSE INFORMATION</b>				
The Course Coordinator is available for consultation at times that is displayed on the coordinator's office notice board. Queries may also be emailed to the Course Teacher's email: kbala@nitt.edu.				
<b>FOR SENATE'S CONSIDERATION</b>				
<p>    <b>Course Faculty</b> </p> <p> <b>CC-Chairperson</b>  </p> <p> <b>HOD</b>  </p>				

3/1/17