



**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI
DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING**

COURSE PLAN – PART I			
Name of the programme and specialization	M.Tech – Materials Science and Engineering		
Course Title	METALLOGRAPHY, MATERIALS TESTING AND CHARACTERIZATION LABORATORY		
Course Code	MT 659	No. of Credits	2
Course Code of Pre-requisite subject(s)	Nil		
Session	July - December 2021	Section (if, applicable)	NA
Name of Faculty	Dr.N.RameshBabu	Department	MME
Official Email	nrb@nitt.edu	Telephone No.	0431 2503464
Name of Course Coordinator(s)	NA		
Official E-mail	NA	Telephone No.	NA
Course Type	Core (M.Tech. lab course)		
Syllabus (approved in BoS)			
1. Study of metallurgical microscope and sample preparation 2. Microscopic examination of ferrous alloys (plain carbon steels, stainless steels, maraging steels and tool steels and cast irons). 3. Microscopic examination of non-ferrous materials (Magnesium alloys, Aluminium alloys, Titanium alloys, Copper alloys, Super alloys). 4. Tensile Testing using Hounsfield and UTM 5. Hardness Measurements (Rockwell, Vickers and Brinell) 6. Impact Testing (Izod and Charpy) 7. Determination of crystal structure and lattice parameters from XRD data 8. Crystallite size determination of materials using XRD 9. Fractography using scanning electron microscope			
COURSE OBJECTIVES			
To learn the principles of material testing and characterization and to apply them for various engineering applications			
MAPPING OF COs with POs			
Course Outcomes	Programme Outcomes (PO)		
1. Prepare the specimens for metallographic examination with best practice, can operate the optical microscope and understand, interpret, analyze the microstructure of materials	[1]		
2. Classify the different mechanical testing methods with their inherent merits and limitations	[1]		



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3. Apply various test methods for characterizing physical properties of materials	[2,4, 6]
4. Recommend materials testing techniques based upon desired results, perform basic statistical analysis on data, and summarily present test results in a concise written format	[3,5, 7]

COURSE PLAN – PART II

COURSE OVERVIEW

The objective of this laboratory course is to provide insight into the latest developments in materials testing and characterization.

COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1-2 weeks	Study of metallurgical microscope and sample preparation	MSTeams-PPTs, Demonstrating Experimental procedure NITT
2	3 rd week	Microscopic examination of ferrous alloys (plain carbon steels, stainless steels, maraging steels and tool steels and cast irons).	
3	4 th week	Microscopic examination of non-ferrous materials (Magnesium alloys, Aluminium alloys, Titanium alloys, Copper alloys, Super alloys).	
4	5 th week	Tensile Testing using Hounsfield and UTM	
5	6 th week	Hardness Measurements (Rockwell, Vickers and Brinell)	
6	7 th week	Impact Testing (Izod and Charpy)	
7	8,9 th week	Determination of crystal structure and lattice parameters from XRD data	
8	10 th week	Crystallite size determination of materials using XRD	
9	11 th week	Fractography using a scanning electron microscope	

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignments	1-13 week	NA	35
2	Mid Test	9-10 week	2 hour	35
3	Final Test / Viva Voce	14 th week	2 hour	30



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***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

The feedback from students will be assessed based on the questionnaire prepared by the Institute and expected attainment to be 75%.

COURSE POLICY (including compensation assessment to be specified)

The students are expected to attend all the classes except for medical reasons. Minimum attendance of 75% is required for writing the semester examination.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

The course coordinator is available for consultation at any time. Students can contact me at any time through phone or e-mail.

FOR APPROVAL

Course Faculty
(Dr. N Ramesh Babu)

CC-Chairperson
(Dr. S. Muthukumar)

HOD
B. Ravisankar