NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	Ferrous Metallography		
Course Code	MTLR11	No. of Credits	2
Department	MME	Faculty	Dr.S.Manivannan
Pre-requisites Course Code	MTPC18		
Course Coordinator(s) (if applicable)	Not applicable		
Tutor(s) E-mail	manivannan@nitt.edu	Contact No.	9363301801
Course Type	Lab course		

COURSE OVERVIEW

This course deals with the effect of sub atomic factors that influence electrical, magnetic and optical properties of different engineering materials. Theories explaining their behaviour will be discussed.

COURSE OBJECTIVES

- To learn and to gain experience in the preparation of metallographic specimens.
- To examine and analyse the microstructures of carbons steels, alloy steels, cast irons and other ferrous materials.
- To understand the basic principles of optical microscopy
  To measure the grain size of materials

COURSE OUTCOMES (CO)

Course Outcomes	**Aligned Programme Outcomes (PO)**
At the end of the course student will be able After the completion of this laboratory course, the student is able to prepare the specimens for metallographic examination with best practice, can operate the optical microscope and understand, interpret, analyze the microstructures of all ferrous materials. semiconductors and their processing methods used in the semiconducting materials industry.	[1, 2, 5, 11]

COURSE TEACHING AND LEARNING ACTIVITIES			
Sl.No	**Week**	**Topic**	**Mode of Delivery**
1	1st& 2nd Week	Specimen preparation for metallographic observation - working of metallurgical microscope	Chalk and Talk and Experiment
2	3rd& 4th Week	Grain size measurements	Chalk and Talk and Experiment
3	5th Week	Sulphur printing and phosphor printing	Chalk and Talk and Experiment
4	6th& 7th Week	Microstructure cast iron - gray, nodular and malleable iron - unetched	Chalk and Talk and Experiment
5	8th& 9th Week	Microstructure of gray, nodular and white iron – etched	Chalk and Talk and Experiment
6	10th week	Microstructure of iron, steel (low carbon, medium carbon, high carbon, hypo and hypereutectoid steels)	Chalk and Talk and Experiment
7	11th& 12th Week	Microstructure of stainless steels and high speed steels	Chalk and Talk and Experiment
8	13th Week	Over heated structure and banded structure in steels	Chalk and Talk and Experiment
9	14th Week	Revision lab class	Experiment

COURSE ASSESSMENT METHODS

Sl.No	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment 1 (Record, Observation and lab Experiment)	1 to 13 th Week	2 hours	50 %
2	Assessment 2 (Written test)	14th Week	1 hour	25%
3	Final Assessment (Final Experiment Written test and Viva)	14th Week	3 hours	25 %

ESSENTIAL READINGS : Textbooks, reference books etc.,

1. Donald C. Zipperian, Ph.D. Pace Technologies "Metallographic Specimen Preparation Basics"
2. Jain P. L., „ Principles of Foundry Technology", 3rd Edition, Tata McGraw Hill, 1995
3. ASM Handbook Volume 9: Metallography and Microstructures

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

The exit survey will be assessed based on the questionnaire prepared by the Institute/class teacher and the expected attainment to be greater 75%. The feedback collected from students by the Institute is to be informed to the teacher to improve the course in future semesters.

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

1. The students are expected to attend all the classes except for medical reasons. Minimum attendance of 75% (including the concession for on-duty and medical reasons) is required for writing the semester examination.
2. The relative grading policy will be followed and the passing minimum marks will be fixed based on Institute guidelines.

ADDITIONAL COURSE INFORMATION

FOR SENATE'S CONSIDERATION

Course faulty (Dr.S.Manivannan)	CC-Chairperson (Dr.S.Jerome)	HOD (Dr.S.P.Kumaresh Babu)