NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Metallurgical and Materials Engineering Department

COURSE OUTLINE

Course Title & Code	MTLR13 Foundry and Welding Laboratory			
Programme & Semester	B.Tech MME & V Semester		**No. of Credits**	1
Department	MME	**Faculty**	Mr.SIVACHITTRAMBALAM V	
Pre - requisites Course Code	MTPC19, MTPC20			
Course Coordinator(s)	Dr. S Jerome			
Other Course Teacher(s)/Tutor(s) E-mail	sivav@nitt.edu	**Telephone No.**	9786778444	
Course Type	Laboratory			

Course Overview

This course will introduce basic mould preparation technique using sand and pattern for casting process. Through sand testing, properties like permeability, grain fineness, shear strength; compression strength and flowability can be evaluated. In welding, types of joints, welding symbol and joining of similar/dissimilar metals using different technique can be apply in various manufacturing applications.

Course Objective

To know the concepts of foundry technology and materials joining technology and to apply them for the advanced manufacturing processing for various structural engineering applications.

COURSE OUTCOMES (CO)

	Course Outcomes	Aligned Programme Outcomes (PO)
1	At the end of the course student will be able Determination of properties of foundry sand	[1,11,12]
2	Understand the foundry melting practice	[1, 11]
3	Develop basic welding skills in manual arc welding processes	[1,2,11,12]
4	Analysis the weldment microstructure	[2,7,9]
5	Analyze the various metallurgical factors affecting mechanical properties of different metals and alloys	[2, 1, 11]

COURSE TEACHING AND LEARNING ACTIVITIES			
Sl.No	**Day/ Month**	**List of Experiments**	**Mode of Delivery**
Welding			
1	17,July	Arc striking practice	Board with marker/ Experimental/Demonstration
2	24,July	Bead on plate welding	
3	31,July	Effect of welding parameter on weld bead	
4	7,Aug	TIG welding (Demonstration)	
5	21,Aug	Microstructural observation of weldments a. Carbon steel, b. Stainless steel, c. Aluminum alloys, d. Titanium alloys, **e.** Dissimilar joints	
6	28 Aug	Summary of Experiments	
Foundry			
7	4 Sep	Determination of permeability, shear strength and compression strength of given foundry sand	Board with marker/ Experimental/Demonstration
8	11 Sep	Determination of clay content for the given moulding sample and also to study the variation of compression strength for various moisture contents	
9	18 Sep	Determination of grain fineness of the given foundry sand	
10	25 Sep	Prepare the mould for the given pattern with core using two boxes and three-box moulding process.	
11	9 Oct	Determination of flowability for the given foundry sand	
12	16 Oct	Foundry Melting practice-demonstration	
13	23 Oct	Summary/Viva Exam	
14	30 Oct	Term end laboratory exam	Descriptive/ Experiment

COURSE ASSESSMENT METHODS			
Sl.No	**Mode of Assessment**	**Marks**	**Weightage%**
1	Observation/Record	15	15 %
2	Experiment/Analysis	25	25 %
3	Assignment	15	15 %
4	Viva	15	15 %
5	Regularity	5	5 %
6	Term end laboratory exam	25	25 %
	Total	100	100%

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc		
1.Workshop practice I, by Hajara choudry 2.Manufacturing Technology, Volume II "Foundry, Welding and Forming by P N Rao"		
COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)		
Students can meet the faculty at any stage in the course duration in case he/she find difficulty in understanding the concepts		
COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)		
Examination		
1	Attending all practical class is mandatory. Students who are missing more than two practical classes are allowed to carry their experiment later but there would be subsequent reduction in weightage of internal assessments.	
2	One additional class shall be conducted after completion of one cycles in lab to students those who missed regular practical classes.	
3	Individual assignment will allocate to student and same should submit without fail	
4	Both internal and external viva will conducted for students to evaluate vertical knowledge	
5	Weightage will be given for regularity in carrying experiments and analysis.	
Attendance		
The minimum attendance for appearing for the semester examination is 75%.		
ADDITIONAL COURSE INFORMATION		
Nil		
FOR SENATE'S CONSIDERATION		
Course Faculty	**CC-Chairperson**	**HOD**
Mr.Sivachittrambalam V V. Sivachittrambalam	Dr. S. Jerome	Dr. S. P. Kumaresh Babu