NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	WELDING PROCESSES – I		
Course Code	MT 603	No. of Credits	3
Department	MME	Faculty	Mr.R.Nivas
Pre-requisites Course Code	Not required		
Course Coordinator(s) (if applicable)	Not applicable		
Tutor(s) E-mail	nivas@nitt.edu	Contact No.	8903486557
Course Type	☒ Core course	☐ Elective course	

COURSE OVERVIEW

This course will introduce the concepts related to different welding processes which are of industrial and research importance. Working principle of each and every welding processes mentioned in the syllabus will be covered. Specific feature which makes a process suitable for joining materials used in different sectors including automobile industry, power plant industry, chemical industries, refineries etc., will be discussed. The effect of different process parameters on productivity and quality will also be dealt in the corresponding lectures. An Industrial visit might be organized to facilitate better understanding of the concepts learnt.

COURSE OBJECTIVES

To understand the various manual and automated welding processes available. To gain knowledge of the concepts, operating procedures, applications, advantages and limitations of various welding processes

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
Upon completion of this class, students are expected to	
1. Identify and list a broad classification of the various welding processes.	1, 11, 12
2. Explain the various manual metal arc welding processes and their Applications.	1, 3, 4, 6
3. Explain the process, advantages, limitations and practical applications of Submerged Arc Welding, Electro slag and Electro gas welding.	3, 11, 12
4. Explain the concepts, various operating procedures and applications of Plasma Welding and magnetically impelled arc butt (MIAB) welding.	7, 10, 12

5. Explain the concepts and applications of various types of Resistance welding processes including Flash Butt welding, Stud Welding and Under water welding.	2, 5, 9

COURSE TEACHING AND LEARNING ACTIVITIES

Sl.No	Week	Topic	Mode of Delivery
1	1st & 2nd week	Introduction to welding processes, Classification of welding processes; Gas welding; Arc physics	• Chalk and Talk • Visual aids (videos & pictures projected on screen)
2	3rd & 4th week	Arc Welding; power source characteristics, Manual metal arc welding: Concepts, types of electrodes and their applications	
3	5th & 6th week	Gas tungsten arc welding: Concepts, processes and applications, Gas metal arc welding: Concepts, processes and applications,	
4	7th week	types of metal transfer, CO_2 welding, pulsed and synergic MIG welding, FCAW	
5	8th week	Assessment – 1	
6	9th & 10th week	Submerged arc welding, advantages and limitations, process variables and their effects, significance of flux-metal combination, modern developments	• Chalk and Talk • Visual aids (videos & pictures projected on screen)
7	11th & 12th week	Narrow gap submerged arc welding, applications; electro slag and electro gas welding; Plasma welding; Concepts, processes and applications, keyhole and puddle-in mode of operation, low current and high current plasma arc welding and their applications;	
8	13th week	Assessment – 2	
9	14th & 15th week	Magnetically impelled arc butt (MIAB) welding, Resistance welding: concepts, types and applications, Flash butt welding, Stud welding and under water welding.	• Chalk and Talk • Visual aids (videos & pictures projected on screen)
10	16th week	Assessment - 3 (Full syllabus). Industrial visit.	
11	17th week	Final Assessment	

COURSE ASSESSMENT METHODS

Sl.No	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment – 1	8th Week	1 hour	20% from assessments 1-3. Best 2 out of 3 will be considered for final grading
2	Assessment – 2	13th Week	1 hour	
3	Assessment – 3 (Full syllabus)	16th Week	1 hour	

4	Final Assessment	17th Week	3 hours	50 %
5	Assignments			10 %

ESSENTIAL READINGS : Textbooks, reference books etc.,

1. Parmer R. S., 'Welding Engineering and Technology', Khanna Publishers, 1997
2. Cary, Howard, "Modern Welding Technology', prentice Hall, 1998
3. Nadkarni S.V., "Modern Arc Welding Technology", Ador Welding Limited, 2010
4. Little, Richard., Welding and Welding Technology", McGraw Hill, 2001

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

1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept.
2. Feedback form issued to students to express their comments about the course before cycle test & after completing the syllabus. Students are requested to give feedback about the course.
3. The student's understanding about the subjects covered will be continuously monitored through their performance in the periodical assessments.

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

1. Examination

a) Appearing for the final assessment is mandatory without which the student cannot pass the subject. In-case of medical emergency, the student will be permitted to appear for a special reassessment covering the entire syllabus along with those who failed to qualify the final assessment which will be scheduled before the commencement of next semester. Only 80% of the marks scored in the special reassessment will be taken into account for grading. A student still fails to meet the pass criteria should REDO the course in the following semester.

b) Assignments will be evaluated based on their quality and individuality. The announced deadline for assignments will be strictly followed. Late submission will result in reduced marks inspite of its quality.

2. Attendance

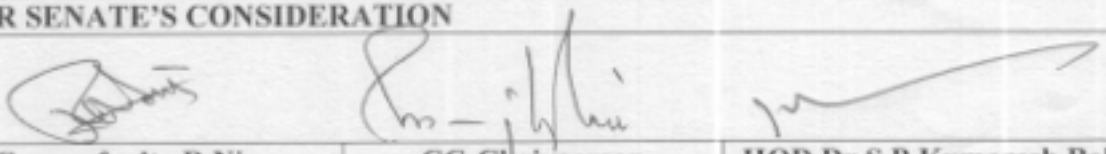
a) All the students are advised to maintain 100% attendance. The minimum attendance for appearing in the final assessment is 75% which could be relaxed only if the student faced any unavoidable medical difficulties during the corresponding semester.

3. The institute follows relative grading with flexibility given to teachers to decide the mark ranges for grades. All assessments of a course will be done on the basis of marks.
4. The pass mark should be x/2 or $x_{max}/3$ whichever is lesser where x is the mean of the class and x_{max} is the maximum mark in the class after the final assessment.
5. The letter grades and the corresponding grade points are as follows

Letter	S	A	B	C	D	E	F	Z	W	U
Grade	10	9	8	7	6	5	0	Absent	Withdrawn	Prevented

a) The marks range for each grade will be decided based on the minimum pass mark.

b) A student who earns a minimum of 5 grade points is declared to have completed the course

c) Students secured F or Z grade may appear in the special reassessment as mentioned in 1- a by registering with the course teacher within 5 days from the date when results are published.
ADDITIONAL COURSE INFORMATION
FOR SENATE'S CONSIDERATION

Course faulty R.Nivas | **CC-Chairperson** | **HOD Dr.S.P.Kumaresh Babu**