

**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

<b>COURSE OUTLINE</b>			
<b>Course Title &amp; Code</b>	MT 603 Welding Process I		
<b>Programme &amp; Semester</b>	M.Tech Welding Engineering & Semester I	<b>No. of Credits</b>	3
<b>Department</b>	MME	<b>Faculty</b>	Mr.SIVACHITTRAMBALAM V
<b>Pre - requisites Course Code</b>	Nil		
<b>Course Coordinator(s)</b>	Mr.SIVACHITTRAMBALAM V		
<b>Other Course Teacher(s)/Tutor(s) E-mail</b>	sivav@nitt.edu	<b>Telephone No.</b>	9786778444
<b>Course Type</b>	<input checked="" type="checkbox"/> Core Course		<input type="checkbox"/> Elective
<b>Course Overview</b>			
<p>This course will introduce the concept related to different welding process which are of industrial and research importance. Working principle of each and every welding process 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.</p>			
<b>Course Objective</b>			
<p>To understand the various manual and automated welding process available. To gain knowledge of the concepts, operating procedures, applications, advantages and limitations of various welding processes.</p>			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>			<b>Aligned Programme Outcomes (PO)</b>
<b>1</b>	Identify and list a broad classification of the various welding process.		<b>1, 11,12</b>
<b>2</b>	Explain the various manual metal arc welding processes and their applications.		<b>1, 3,4,6</b>
<b>3</b>	Explain the process, advantages, limitations and practical applications of Submerged Arc Welding, Electro slag and Electro gas welding.		<b>3,11,12</b>
<b>4</b>	Explain the concepts, various operating procedures and applications of Plasma Welding and magnetically impelled arc butt (MIAB) welding.		<b>7,10,12</b>
<b>5</b>	Explain the concepts and applications of various types of Resistance welding processes including Flash Butt welding, Stud Welding and Under water welding		

**COURSE TEACHING AND LEARNING ACTIVITIES**

Sl. No	Week	Topic	Mode of Delivery
1	1 <sup>st</sup> & 2 <sup>nd</sup>	Introduction to welding processes, Classification of Welding processes; Physics of Arc Welding.	Board with Marker & PPT
2	3 <sup>rd</sup> & 4 <sup>th</sup>	Gas welding-CO2 welding, Arc Welding; Manual metal Arc welding; Concepts. Types of electrodes and their applications; Role and Importance of shielding gas.	Board with Marker & PPT
3	5 <sup>th</sup>	GMAW/MIG concepts, processes and applications. Modes of Metal transfer; Gas Tungsten Arc Welding (GTAW/TIG); concepts, processes and applications	Board with Marker & PPT
4	6 <sup>th</sup> & 7 <sup>th</sup>	Pulsed and synergic MIG welding, Pulse TIG welding	Board with Marker & PPT
5	8 <sup>th</sup> & 9 <sup>th</sup>	Submerged Arc welding, advantages and limitations, process variables and their effects, significance of flux-metal combination, modern developments	Board with Marker & PPT
6	10 <sup>th</sup>	Narrow gap submerged arc welding, applications; electro gas welding; Electroslag welding process	Board with Marker & PPT
7	11 <sup>th</sup> & 12 <sup>th</sup>	Plasma welding; concepts, processes and applications, Keyhole and puddle-in mode of operation, low current and high current plasma arc welding and applications	Board with Marker & PPT
8	13 <sup>th</sup> & 14 <sup>th</sup>	Resistance welding-Introduction, classifications, type's concepts, process and applications.	Board with Marker & PPT
9	15 <sup>th</sup>	Summary of all welding process	Board with Marker & PPT

**COURSE ASSESSMENT METHODS**

Sl.No	Mode of Assessment	Duration/Marks	Weightage%
1	Cycle Test 1 (Descriptive)	60 min/50 Marks	15%
2	Cycle Test 2 (Descriptive)	60 min/50 Marks	15%
3	Retest (Descriptive)	-	-
4	Seminar	20 min/10 Marks	10%
5	Quiz I, II (Objective)	10 min/10 Marks	10%
6	Term End Exam	180 min/100 Marks	50%
		Total	100%

**ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc**

1. Parmer R. S., 'Welding Engineering and Technology', Khanna Publishers, 1997
2. Cary, Howard, "Modern Welding Technology", prentice Hall, 1998
3. Welding Handbook, Volume 2, 7th Edition, American Welding Society.

**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
- Students who have missed the Cycle test I and II or both, are only eligible to register the Retest examination which shall be conducted after the completion of 2<sup>nd</sup> cycle test and before the end semester examination.
  - Student who have missed both cycle test and registering for retest are eligible for only 15% weightage of total allocated 30 % weightage in cycle test I,II.

2 Retest shall be conducted for 15% weightage marks, comprising the syllabus of both first and second cycle test. If student miss retest (those who registered for retest), there is no provision for them for future test and weightage will be counted as zero.

3 Students should present a seminar on the assigned topic related to this course. Weightage to the seminar would be zero for the case of the students not presenting the particular seminar. No provision for re-seminar.

4 Quiz will be conducted to test vertical knowledge of students in respective domain. No re-quiz for those missing quiz.

5 The passing mark and the grading will be assigned as per institute norms.

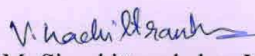
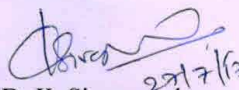
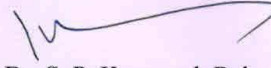
**Attendance**

The minimum attendance for appearing for Cycle Test I,II and the semester examination is 75%.

**ADDITIONAL COURSE INFORMATION**

Nil

**FOR SENATE'S CONSIDERATION**

Course Faculty	CC-Chairperson	HOD
 Mr.Sivachitrambalam V	 Dr.K. Sivaprasad	 Dr. S. P. Kumaresh Babu

**Note:**

- The weeks mentioned in above course plan may vary sometimes with actual class but the order of topics in the course plan will remain same.