



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

COURSE PLAN – PART I			
<b>Name of the programme and specialization</b>	<b>M.TECH. WELDING ENGINEERING</b>		
<b>Course Title</b>	<b>Joining of Materials - II</b>		
<b>Course Code</b>	<b>MT606</b>	<b>No. of Credits</b>	<b>3</b>
<b>Course Code of Pre-requisite subject(s)</b>	<b>Nil</b>		
<b>Session</b>	<b>Jan 2023</b>	<b>Section (if, applicable)</b>	<b>NA</b>
<b>Name of Faculty</b>	<b>Dr. A. Muthuchamy</b>	<b>Department</b>	<b>MME</b>
<b>Email</b>	<a href="mailto:muthuchamy@nitt.edu">muthuchamy@nitt.edu</a>	<b>Telephone No.</b>	<b>9445939319</b>
<b>Name of Course Coordinator(s) (if, applicable)</b>	<b>NA</b>		
<b>E-mail</b>		<b>Telephone No.</b>	
<b>Course Type</b>	<input checked="" type="checkbox"/> <b>Core course</b> <input type="checkbox"/> <b>Elective course</b>		
<b>Syllabus (approved in BoS)</b>			
Friction welding: Concepts, types and applications. Friction stir welding: Metal flow phenomena, tools, process variables and applications and induction pressure welding: Process characteristics and applications Explosive, diffusion and ultrasonic welding, principles of operation, process characteristics and applications EBW: Concepts, types and applications. LBW: Physics of lasers, types of lasers, operation of laser welding setup, advantages and limitations, applications Soldering: Techniques of soldering, solders, phase diagram, composition, applications Brazing: Wetting and spreading characteristics, surface tension and contact angle concepts, brazing fillers, role of flux and characteristics, atmospheres for brazing, adhesive bonding Cladding, Surfacing and Cutting			
<b>COURSE OBJECTIVES</b>			
Understand the various manual and automated welding processes available. Gain knowledge of the concepts, operating procedures, applications, advantages and limitations of various welding processes			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>			<b>Aligned Programme Outcomes (PO)</b>
At the end of the course student will be able to:			
1. Explain the principle of friction welding and its variants			<b>1, 3, 5, 9</b>
2. Explain the process, advantages, limitations and practical applications of explosive welding, electron beam welding and laser welding.			<b>1, 3, 5, 6, 9</b>
3. Explain the concepts, various operating procedures and applications of soldering and brazing			<b>8, 9</b>

4. Explain the concepts and applications of various types of cladding, surfacing and cutting.				9, 11
<b>COURSE PLAN – PART II</b>				
<b>COURSE OVERVIEW</b>				
The course discuss in detail about the principles and extraction of the some important non-ferrous metals and their significance to the mankind				
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>				
<b>S.No.</b>	<b>Week/Contact Hours</b>	<b>Topic</b>	<b>Mode of Delivery</b>	
1	I-III	Basic principles of Solid state welding and its significance	Lectures + animated/real videos	
2	IV-VI	Principle of friction welding and its variants		
3	VII-IX	Principles of explosive welding, electron beam welding and laser welding.		
4	X-XI	Concepts, various operating procedures and applications of soldering and brazing		
5	XII-XIII	Concepts and applications of various types of cladding, surfacing and cutting.		
<b>COURSE ASSESSMENT METHODS (shall range from 4 to 6)</b>				
<b>S.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Cycle test - I	24 <sup>th</sup> Feb 2023	60	25
2	Cycle test - II	24h March 2023	60	25
3	Assignment	2 <sup>nd</sup> week of April	--	20
CPA	Compensation Assessment	XIII	60	25
4	Final Assessment	As per institute time table	180	30
<b>COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)</b>				
The exit survey will be assessed based on the questionnaire prepared by the class teacher and expected attainment is 75% on 1-10 scale basis				
<b>COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)</b>				
<b><u>MODE OF CORRESPONDENCE (email/ phone etc)</u></b>				
Email/Mobile				
<b><u>COMPENSATION ASSESSMENT POLICY</u></b>				
It will be given during XIII week for those who are absent on genuine grounds for any one of the Cycle Tests.				

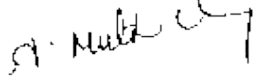
**ATTENDANCE POLICY**

- Institute guidelines will be followed for attendance

**ADDITIONAL INFORMATION**

The Course faculty is available for consultation at any time. Students can also contact him at any time through whatsapp or phone call or by mail.

**FOR APPROVAL**



**Course Faculty**  
**Dr. A. Muthuchamy**



31-01-2023

**CC-Chairperson**  
**Dr. Katakam Siva Prasad**



**HOD**  
**Prof. S. Muthukumaran**