DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	**M.TECH. WELDING ENGINEERING**		
Course Title	**Joining of Materials - II**		
Course Code	**MT606**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**Nil**		
Session	**Jan 2021**	**Section (if, applicable)**	**NA**
Name of Faculty	**Dr. A. Muthuchamy**	**Department**	**MME**
Email	**muthuchamy@nitt.edu**	**Telephone No.**	**9445939319**
Name of Course Coordinator(s) (if, applicable)	**NA**		
E-mail		**Telephone No.**	
Course Type	✓ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

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

COURSE OBJECTIVES

Understand thevarious manual and automated welding processesavailable. Gain knowledge of the concepts, operating procedures, applications, advantages and limitations of various welding processes

COURSE OUTCOMES (CO)

Course Outcomes	**Aligned Programme Outcomes (PO)**
At the end of the course student will be able to:	
1. Explain the principle of friction welding and its variants	**1, 3, 5, 9**
2. Explain the process, advantages, limitations and practical applications of explosive welding, electron beam welding and laser welding.	**1, 3, 5, 6, 9**
3. Explain the concepts, various operating procedures and applications of solderingand brazing	**8, 9**

4. Explain the concepts and applications of various types of cladding, surfacing and cutting.	**9, 11**

COURSE PLAN – PART II

COURSE OVERVIEW

The course discuss in detail about the principles and extraction of the some important non-ferrous metals and their significance to the mankind

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	I-III	Basic principles of Solid state welding and its significance	Online 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 solderingand brazing	
5	XII-XIII	Concepts and applications of various types of cladding, surfacing and cutting.	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Mid semester exam	Feb 22nd to Feb 26th	60	30
2	Quiz	March 22nd to March 26th	20	20
3	Assignment	April 22nd to April 26th	--	20
CPA	Compensation Assessment	XIII	60	30
4	Final Assessment	XV	120	30

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

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

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Email/Mobile

COMPENSATION ASSESSMENT POLICY

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	CC-Chairperson	HOD
Dr. A. Muthuchamy	**Dr. Ramesh Babu**	**Prof. B. Ravisankar**