DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	M.TECH. INDUSTRIAL METALLURGY		
Course Title	METAL JOINING		
Course Code	MT703	No. of Credits	4
Course Code of Pre-requisite subject(s)	Nil		
Session	Aug. 2023	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)			
E-mail		Telephone No.	
Course Type	☑ Core course	☐ Elective course	

Syllabus (approved in BoS)

Classification of welding processes, energy sources used in welding, working principle,advantages, limitations of arc welding processes –MMAW, GTAW, GMAW, SAW, ESW &EGW Working principle, advantages and limitations of solid state welding processes. - Friction,friction stir, explosive, diffusion and ultrasonic welding.

Working principle, advantages and limitations of power beam processes: Plasma arc welding,electron beam & laser beam welding.

Principles of operation, process characteristics, types and applications – Resistance welding,Gas welding, brazing, soldering and joining of non-metallic materials.

Welding metallurgy: Introduction, thermal cycles, prediction of peak temperature, pre heat andcooling rate, PWHT. Weldability of carbon steel, stainless steel & aluminum. Hot & coldcracking phenomenon, weld defects, causes and their remedies

COURSE OBJECTIVES

To know the concepts of different materials joining technology and emphasis onunderlying science and engineering principle of every processes.

COURSE OUTCOMES

At the end of the course, students will be able to		PO Correlation
CO1	Understand the working principle, merits and demerits of different joining processes.	1, 5
CO2	Understand the working principle and importance of welding allied processes	1, 2, 6
CO3	Learn weldability and welding related problems of different materialsSolve welding heat flow related	1, 2, 5, 6, 9

COURSE PLAN – PART II

COURSE OVERVIEW

The course discusses in detail about the basic principles of Welding processes and Welding metallurgy and apply those principles to engineering applications

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	I-III	Important aspects of Welding and Classification of welding processes	Online power point+ animated/real videos
2	IV-VI	Arc welding processes	
3	VII-IX	Solid-state welding processes	
4	X-XI	Advanced welding processes	
5	XII-XIII	Welding metallurgy of steels and some non-ferrous alloys	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration (in Mins)	% Weightage
1	CT - 1	VI	60	30
2	Technical Presentation	VI-XII	30	20
3	CT - 2	X	60	20
CPA	Compensation Assessment*	XII	60	30
5	Final Assessment *	As per Institute calendar	**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 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: Email

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(A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

ACADEMIC DISHONESTY & PLAGIARISM

☐ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

ADDITIONAL INFORMATION

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

FOR APPROVAL

Course Faculty_____ **CC-Chairperson**_____ **HOD**_____

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