

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Bachelor of Technology			Branch/Spec.		Mechanical Engineering		
Semester		VIII			Version		2.0.0.0		
Effective from Academic Year			2021-22		Effective from the batch Admitted in			July 2018	
Subject code		2ME81PE1	Subject Name		Welding Technology				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites:									
Knowledge of Welding processes									
Course Objective:									
<ul style="list-style-type: none"> • To perform on different welding techniques and gain knowledge of the concepts, operating procedures, applications, advantages and limitations of various welding processes. • Define the problem that occurs on the arc welding and recognize the type of metal, electrode, and tools that are used in arc welding. • To know safety measure when use the welding machine along the welding process. • Understand the various codes and standards on welding applications. 									
Theory syllabus									
Unit	Content							Hrs	
1	WELDING PROCESSES, PRINCIPLES & EQUIPMENT STUDY: Manual metal arc welding, Tungsten inert gas welding, Metal Inert gas welding, Submerged Arc welding, Electron Beam welding, Laser beam welding, Resistant welding, Friction Welding, Plasma welding, Under water welding, Selection of processes & Selection of electrode, welding defects. Effect of Process Parameters.							10	
2	METALLURGICAL ASPECTS OF WELDING: Heat affected zone, Metal solidification, stresses residual and thermal, Distortion of parts, Dilution, Pre heat and post heat treatment, Methods to relieve welding stresses.							7	
3	AUTOMATION IN WELDING: Types of Weldment Holding Devices, equipment productivity in welding, Temperature Consideration & duty cycle of drives.							4	
4	WELD JOINT DESIGN AND REPAIR OF WELDMENT: Position, groove and edge preparation, design consideration for best weld, repair process for defects							6	
5	TESTING AND INSPECTION OF WELDMENTS: Various tests like Tensile, Impact, Bend, Hardness, Non-destructive test like Visual, dye penetrant test, magnetic particle test, radiography test, ultrasound test as per standards							6	
6	WELDING CODES AND STANDARDS: Weld Procedure Specification, Procedure Qualification Record understanding, importance of various Essential, Supplementary Essential, Non-Essential Variable							6	
7	ADVANCED WELDING PROCESS: Friction stir welding, Narrow gap welding, Activated TIG welding, Orbital welding							6	
Practical content									
The term work shall be based on experimental and analytical work on topics mentioned above									

Text Books	
1	R.S. Parmar, "Welding Technology", Khanna Publisher, Delhi. 2 nd Revised Edition.
2	Rechar L. Little, "Welding and Welding Technology", Mc Graw Hill, New Delhi. 2004.
Reference Books	
1	Newnes, "Fusion Welding and Brazing of Copper Alloys", Butchworths, London, 2006.
2	H. G. Ranjon, "Welding Metallurgy", Jaico Publishing House, Mumbai.2007.
3	L. M. Goyrd, "Principle of Welding Technology", Viva Books Pvt. Ltd, New Delhi.2006.
4	David Widgery, "Tubular Wire Welding", Jaico Publishing House, Mumbai. 2009.
5	Larry Jeffus, "Welding Principles and Applications", Cengage Learning International Edition, USA. 7 th Edition.
6	Howard Cary, " Modern Welding Technology", Prentice Hall, USA. 6 th Edition.
Mooc Links:	
1	https://nptel.ac.in/courses/112/103/112103263/
2	https://nptel.ac.in/courses/112/103/112103244/
3	https://nptel.ac.in/courses/112/107/112107213/
4	https://nptel.ac.in/courses/112/107/112107089/
Course Outcomes:	
After learning this course, student should be able to:	
<ol style="list-style-type: none"> 1. Understand the basic of various process of welding 2. Learn and Evaluate metallurgical and mechanical aspect of welding processes. 3. Learn and implementation testing of welded components. 4. Learn about the welding codes and standards. 5. Learn about WPS, PQR and WPQR. 	