

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Production Engineering

### B. E. SEMESTER: VI

Subject Name: **Welding Technology**

Subject Code: **162502**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
4	0	2	6	70	30	50

Sr. No.	Course Contents	Total Hrs
1.	<b>Metal Joining Processes</b>  Introduction, classification of welding processes as per AWS, commonly welded base metals, advantages and disadvantages of welding. Welding as compared to riveting and casting. Soldering, brazing, adhesive bonding processes, welding of dissimilar metals.	06
2.	<b>Gas Welding Processes</b>  Introduction, oxy-acetylene welding, oxy-hydrogen, air-acetylene welding. Principle of operation, types of welding flames, Lighting the torch, flame adjustment, gas welding techniques .welding techniques- leftward & rightward. Filler metals and fluxes, gas welding equipments, applications.	08
3.	<b>Arc Welding Processes</b>  Introduction, Principle, Working, Specifications, Equipments, Merits and demerits, applications of Carbon arc welding, Flux Shielded Metal arc Welding, Gravity Welding, Sub Merged Arc Welding, GTAW Welding, GMAW Welding, CO <sub>2</sub> Welding, Flux Cored Arc Welding(FCAW),Electro Slag welding, Electro Gas welding, Plasma Arc Welding. Source of Power Supply: AC/DC & their characteristics	12
4.	<b>Resistance Welding Processes</b>  Introduction, Principle, Working, Specifications, Equipments, Merits and demerits, applications of Spot welding, Seam welding, Projection Welding, Upset welding, Flash Butt welding, Percussion Welding.	06

<b>5.</b>	<b>Solid State and Thermo chemical and Processes</b> Introduction, Principle, Working, Specifications, Equipments, Merits and demerits, applications of Solid State welding Processes like Cold (or pressure welding), Diffusion(Bonding), Explosive welding, Friction ,Inertia and forged welding. Thermo chemical welding processes like thermit welding, atomic hydrogen welding.	06
<b>6.</b>	<b>Weld Defects &amp; Tests</b> Introduction, type of defects in weldments, causes and remedies of defects. Repair of defective welds, Visual examination of welding, Fabrication Weldability tests , Hydrostatic Pressure testing and Hydraulic or Gas Pressure testing for leakage, Use of NDT for weldments, Pre and post weld heat treatment, safety standards	10
<b>7.</b>	<b>Arc Welding Electrodes</b> Types, Details , Categories of welding electrodes, Ingredients of coating and their functions, Selection of Electrodes, Classification and Coding of mild steel and low alloy steel electrodes as per Indian and American System.	06
<b>8.</b>	<b>Weld Joints &amp; Metallurgy</b> Various types of weld joints & weld symbols, Standard location of elements of welding symbols. Heat affected zone and its properties.	06

### **Text Books:**

1. Welding Processes and Technology by R.S.Parmar, Khanna
2. Welding Technology by O. P. Khanna, Dhanpat Rai & Sons

### **Reference Books:**

1. Welding and Welding Technology by Little, McGrawhill
2. Welding Technology for Engineers by Rai, Narosa
3. WS welding Handbook, Vol 1 to 4 AWS
4. Welding Engineering & Technology by R S Parmar, Khanna