5041 - WELDING ENGINEERING ✓

Teaching Schedule Per Week			Progressive Assessment	Examination Schedule (Marks)			
				Theory		Practical Ex.	Total
Lectures	Practical	Credits					
3	2	5	50	3 Hrs	100	25/OR	175 ~~150~~

Pre-requisite	Source
Nil	MEC

Semester	Theory	Test	Total	TW	PR	Gr Total

Rationale:-Welding engineering is a field that has applications in various aspects of welding is essential for technicians desirous of taking up career in welding design and fabrication. The contents of this course aim at achieving the objective of training the technician at this higher level of technology.

COURSE CONTENTS	Hrs	Mks
1. INTRODUCTION Classification of welding process, Introduction to other joining process; Metal cutting process; Factors affecting selection of welding process.	3	6
2. METALLURGY OF WELDING :- Introduction, Heat flow in and around weld metal, Metallurgical effects due to welding, Influence of gases on welding metals,	3	6
3. TYPES OF JOINTS, WELDS AND WELDING POSITIONS	3	6
4. GAS WELDING Equipment, tools, accessories and their setup; Consumable such as gases, fluxes, filler metals and their selection; Gas flame characteristics and applications; Torch manipulation and movements.	6	12
5. ARC WELDING Selection, construction, setup and working of equipment, tools and accessories such as: 1 Power sources, 2 Welding cables, 3 Electrodes Polarity in welding , 3 Welding preparations, 4 Factors Influencing welds, 5 Shrinking of arc, 6 Carbon Arc welding, 7 Special process of arc welding: 1) T I G, .2) M I G, .3) S A W, 4) CO2, 5) Plasma Arc Welding	8	18
6. WELDING PROCESS Introduction to welding process with respect to working principal, equipment, applications, merit and demerits, (A) Resistance welding,.1) Spot welding, .2) Bulf welding, .3) Seam welding. (B) Solid State welding, .1) Ultrasonic, 2) Friction (C) Thermit welding, (D) Brazing and Soldering.	7	16
7. DEFECTS IN WELDING Causes and Remedies : 1: Cracks, 2.: Incomplete penetration, 3.: Slag Inclusion, 4.: Porosity, 5.: Blowholes, 6 Spatter, 7 Under cutting, 8 Overlapping.	4	8
8. WELDING DISTORTION Concept of distortion; Types of distortion and their control; Pre-heating and post weld heat treatment.	4	8
9. INSPECTION AND TESTING OF WELDS Stages in weld inspection and testing; Non-destructive tests: Visual inspection, X-Ray and X-Ray radiography, Die Penetrant test, Magnetic Practical test, Ultrasonic test; Destructive tests: 1) Tensile Test, 2) Bent Test, 3) Impact Test, 4) Hardness Test		12
10. SAFETY PRECAUTIONS IN WELDING Protective clothing; Head protection; Foot protection; Eye protection; Precaution while working at heights; Ventilation in confined spaces.	4	8
Total	48	100

TERM WORK

1. One job stringer beading in overhead welding .
2. One job in butt or 'T' joint in flat position
3. Demonstration of pipe welding on T I G
4. Demonstration of inspection and testing techniques.

REFERENCE BOOKS;-

Welders guide and Hand book (Audels Services) by James E. Brumbangh
A Text book of welding Technology by Shri O.P. Khanna.
Basic Fabrication and Welding Engineering by F.J.M Suthla.