WELDING TECHNOLOGY COURSE – PCP (THEORY & PRACTICAL) TRAINING SCHEDULE

Total course duration (320 hr)		
PCP (120 hrs)		Self learning (200 hrs)
Practical (80 hrs)	Theory (40 hrs)	

	Schedule		PCP- Topic				Learning outcomes
Week	Topic	Day	Duration (Hr)	Theory	Duration (Hr)	Practical	After doing the PCP learner would be able to-:
Week 1	Introduction of welding process Electric arc Welding	Day 1	2hrs	• Introduction of Welding • Need of Welding Process • Different types of Welding Process. • Application of Welding process in different industries	3 hrs	• Physical demonstration of a Electric arc welding. • Demonstration of welding application (use ppts/videos).	• differentiate between various welding processes. • identify different parts of a electric arc machine. • identify different parts of gas welding set up. • differentiate various color codes of cylinders in a gas welding set up. • identify the voltage required for electric arc welding • identify various gases used for gas
	Gas Welding	Day 2	2hrs	• Introduction of Reviving and • Gases used their source in gas welding. • Introduction of gas welding machine.	3hrs	• Physical demonstration of Gas Welding setup • Physical demonstration of cutting torch.	

				• Introduction to electrode.			welding process. • operate the gas welding machine. • observe the use of electrode in electric arc welding
Week 2	Safety during Gas Welding	Day 1	2hrs	• Introduction of safety • Needs of safety precaution • Difference between AC & DC	4hrs	• Physical demonstration of all safety of use and display charts.	• identify & use various safety gadgets. • wear proper safety gadgets while performing welding operations. • differentiate between ac & dc supply.
	Safety during Gas Welding	Day 2	2hrs	• Introduction of safety in gas welding process • Different safety precautions required in gas welding • Introduction about hazard • Carrying gas cylinders during gas welding	4hrs	• Physical demonstration of all safety of use and display charts • To operate the spark lighter	• state the specification of different gases used for gas welding. • identify the color code of the gas cylinder. • identify the hazard during gas welding operations. • adopt proper safety precautions during gas welding operation. • handle the gas cylinder.
Week 3	Electric arc Welding	Day 1	2hrs	• Introduction of Electric arc welding machine ac and DC • Use of Electrode in Electric arc welding • Material of Electrode • Function of flux	4hrs	• To mark the connection for welding machine • To prepare the work piece for welding • Practice on Electric are welding machine on 75mm x5mmx50mm (2 piece) for making any one joint (i) V- groove (ii) U- groove	• differentiate between step-up and step down transformer. • identify the material of electrode. • make the connections of the welding machine. • operate an electric arc welding machine. • prepare work piece (edge selection) for electric arc welding . • make different joints with the help

						(iii) T- joint	of electric arc machine.
	Gas Welding Equipments	Day 2	2hrs	• Introduction of Gas Welding • Type of Gas used in gas welding • Use of cutting torch • Pressure regulator	4hrs	• To prepare the setup for gas welding • To prepare the work piece for gas welding • Practice on gas welding on 75mmX10MMX3.0MM (2 pices) for making any joint • Lap joint • Butt joint • T- joint	• make the connections of the welding machine. • operate a gas welding machine. • prepare work piece (edge selection) for gas welding . • make different joints with the help of electric arc machine.
Week 4	Type of welding joints by Electric arc welding and Gas Welding	Day 1	2hrs	• Introduction of Welding Joint • Types of Welding Joint • Application of welding joint • Need of Edge	4hrs	• Preparation of Joints (Edge Preparation by file) • Making of a lap joint of given job • Making of butt joint of a given job • Making of a corner joint of a given job • Making of a T- Joint of a given job (Joints will be prepared by Electric arc welding)	• identify different types of welding joint. • pre pare the work piece for making welding joints. • carry out welding process for making different types of joints.
		Day 2	2hrs	• Different process of metal joining – • Riveting • Soldering • Brazing	4hrs	• Same joints will be pre pared by gas welding	• identify different process of metal joining. • pre- pare the work piece for making welding joints • carry out welding process for making different types of joints.
Week 5	Acetylene- properties and acetylene cylinders	Day 1	2hrs	• What is flammable gas • Properties of acetylene gas	4hrs	• Measurement of C_2H_2cylinder by learner at shop floor	• state the properties of acetylene gas. • produced acetylene at work shop

				• Low pressure and high pressure • Methods for generation of C_2H_2 at shop floor • Pressure measurement of C_2H_2		• Reaction of $CaC_2$with H_2O for production of C_2H_2 at shop floor. • Handling of a pressure regulator	• identify acetylene cylinder by observation. • measure cylinder pressure.
	Oxygen: its properties and oxygen cylinders	Day 2	2hrs	• Why gas in used in gas welding? • Properties of gas • Color and size of gas cylinder • Pressure measurement of gas	4hrs	• Measurement of pressure of gas cylinder at shop floor • Practice for taking the reading by a pressure regulator.	• state the properties of various gases. • read the pressure regulator • differentiate between the gas cylinder of oxygen & acetylene by observation • use the pressure gauges for measuring pressure of gas cylinder.
Week 6	Defects in welding and there inspection	Day 1	2hrs	• What is a welding defect • What is a inspection • Define the internal and external defects. • Sources of defects	4hrs	• Welding on a given job and root it in wafer for a crack • Welding on a given job for any distortion (without use of any fixtures). • Welding on a given job with high speed for different defects. (minimum 5 piece)	• identify different welding joints • carry appropriate precaution during welding operations. • identify &use fixture in welding wherever required. • inspect & locate welding defects • carry out welding for any distortion. • carry out proper remedial action
		Day 2	2hrs	• Preventive measures for eliminating welding defects.	4hrs	• Prepare butt joint between 2 pieces of M.S. 150 X 50X 2 in flat position controlling distortion like overlap and buckling using tack weld	

						and jigs for corner joints.	for welding defects.
Week 7	Welding of mild steel	Day 1	2hrs	• Introduction of mild steel flat • Properties of mild steel flat • Chemical properties of M M.S flat • Electric are welding of M.S flat • Gas welding of M.S flat	4hrs	• Edge preparation of given M.S flat job V,U groove. • Electric arc welding of above given job. • Gas welding of a above given job	• define the properties of mild steel and relate its use for fabrication purpose. • prepare groove for electric are gas welding in m.s flat. • carry out gas welding of m.s flat.
	Welding of Stainless steel	Day 2	2hrs	• Introduction of stainless steel (S.S) • Different grade such as 304, 316 of stainless steel • Properties of stainless steel • Requirement of S.S in fabrication industries. • Electric arc welding of S.S	4hrs	• Electric arc welding practice on S.S flat • Electric arc welding practice on S.S pipe	• define the properties of stainless steel. • differentiate between various grades of steel. • carry out electric arc welding of stainless steel.
Week 8	Welding of Aluminum	Day 1	2hrs	• Introduction of Aluminum and its alloys. • Different grade of Aluminum such as 6061,6063,7075 • Properties of Aluminum • Need of Aluminum in fabrication industries. • Introduction of MIG/TIG Welding of Aluminum	4hrs	• MIG Welding Practice on Aluminum. • TIG Welding Practice on Aluminum.	• define the properties of aluminium. • differentiate between various grades of aluminium. • weld the aluminum by mig/tig welding machine.
	Welding of Cast Iron	Day 2	2hrs	• Introduction about the cast iron • Types of cast iron • Properties of cast iron	4hrs	• Welding cast iron by gas welding technique. • Welding of cast iron by Electric are welding	• carry welding of cast iron by gas welding • carry welding of cast iron by

				• Need of cast iron in Industries.			electric arc welding • case during the welding of cast iron
Week 9	Welding of Copper	Day 1	2hrs	• Introduction of copper • Properties of a copper • Use of copper in Industries	4hrs	• Copper welding by gas welding technique. • Copper welding by Electric arc welding. • Heating of copper by oxy acetylene welding	• carry welding of copper with gas welding • carry welding of copper with electric are welding • perform heating operation on copper using gas welding.
	Welding Positions	Day 2	2hrs	• Introduction of different welding positions such as • Flat – Horizontal- Vertical Overhead- 1G,2G,3G,4G,5G,6G	4hrs	• Practice on a work piece in • Flat position (1G) • Horizontal Position (2G) • Vertical Position (3G) • Over head Position (4G) • Over head Pipe Welding(5G) • Pipe Welding at an angle (6G)	• perform flat position(1g) welding • perform horizontal position (2g) • perform vertical position (3g) • perform over head position (4g) • adopt proper precaution while performing welding at different positions.
Week 10	Flame cutting	Day 1	2hrs	• Introduction of gas flame cutting • Equipment used for cutting purpose • Different between welding torch and cutting torch • Safety precautions.	4hrs	• Practice for material cutting by oxy acetylene gas welding. • Perform flame setting. • Use the proper safety gadgets while performing the above operation.	• state the different flame cutting methods. • identify the equipments used in cutting. • demonstrate manual & machine cutting and flame setting. • adopt the proper safety precautions required during cutting.

	Industry visit	Day 2	2hrs	• Observe the equipments, type of welding process used in the welding shop. • Observe the cost of the equipments & machinery used also the cost of the consumables. • Observe the safety precautions involve in welding operations.	6 hrs	• Visit to the welding workshop or shop.	• estimate the cost of the equipments & machinery required in welding operations. • acquaint with the safety precautions required in the workplace. • identify the scope as a welder.