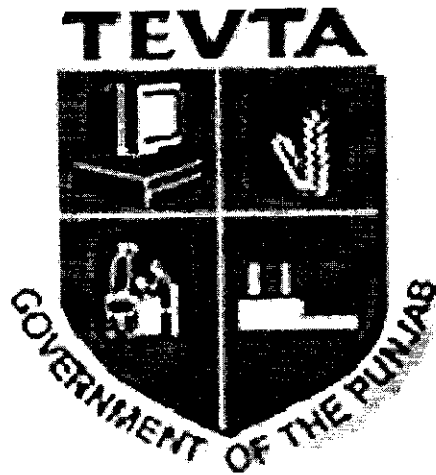


GOVERNMENT OF PUNJAB
TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY



CURRICULUM FOR

WELDER

(6 –Months Course)

(SMWA, GTAW, GMAW, Gas Welding & Gas Cutting)

Revised April 2016

APPROVED

Date: 7-4-16

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CURRICULUM SECTION
ACADEMICS WING

96-H, GULBERG-II, LAHORE

Ph # 042-99263055-9, 99263064

gm.acad@tevta.gop.pk, manager.cur@tevta.gop.pk

TRAINING OBJECTIVES

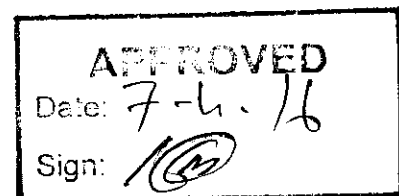
Construction industry is expanding day by day due to enhanced development in industrial, commercial and real estate enterprises. As a result of this fact, the job demand of trained labor and field staff have been increased.

This curriculum has been developed keeping in view the requirements of construction industry by more focusing on practical along with necessary required theoretical knowledge and work ethics.

This curriculum covers the major topics of basic metal work, measuring tools, Shielded metal arc welding (SMAW), Gas tungsten arc welding (GTAW) or Tungsten inert gas (TIG) welding, Gas metal arc welding (GMAW) or Metal inert gas (MIG) welding, Gas welding/cutting, different welding positions for plate & pipe welding, construction fabrication alongwith functional English and information technology.

CURRICULUM SALIENTS

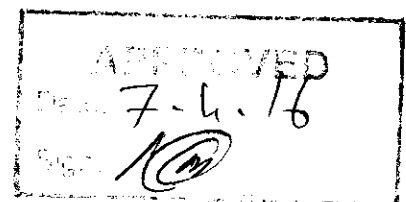
Name of the course	Welder (SMWA, GTAW, GMAW, Gas Welding & Gas Cutting)
Entry Level	Middle preferable Matric
Duration of Course	6 – Months 800 Contact Hours
Training Methodology	Practical 90% Theory 10%
Medium of Instruction	Urdu / English



SKILL COMPETENCY DETAILS

On successful completion of this course, the trainee should be able to:

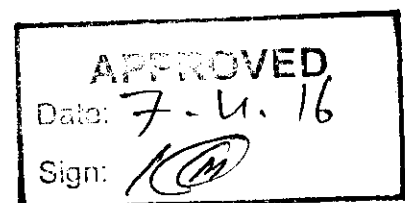
1. Apply all safety precautions about tools, equipment & each welding process.
2. Make bevel of the plate/pipe to make it ready for welding.
3. Apply shielded metal arc welding by selection of electrodes.
4. Apply gas tungsten arc welding by selection of tungsten electrode.
5. Apply gas metal arc welding by selection of filler wires.
6. Apply arc welding by selection of current setting.
7. Prepare different welding positions both for plate & pipe welding.
8. Prepare different welding defects, their reasons, effects and remedies.
9. Apply gas welding /gas cutting.
10. Make welding on various parts / jobs as per design and drawing.
11. Make the project of construction fabrication as per drawing & designs.



KNOWLEDGE PROFICIENCY DETAILS

On successful completion of this course, the trainee should be able to:

1. Explain the measuring tools.
2. Explain the marking tools.
3. Define the drilling.
4. Define the cutting tools.
5. Explain the usage of tools safely.
6. Explain the shielded metal arc welding by selection of electrodes & current setting.
7. Explain tungsten inert gas welding and its shielding gas.
8. Explain metal inert gas welding and its shielding gas.
9. Explain gas welding/cutting.
10. Explain the construction fabrication of the construction industry.
11. Explain the drawing of construction fabrication.
12. Explain different welding positions for plate & pipe welding.



SCHEME OF STUDIES

**Welder
(6 Months Course)**


S. No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Awareness about Safety	12	0	12
2.	Introduction of Tools & Basic Metal work	18	10	28
3.	Gas Welding And Gas Cutting	4	-	4
4.	Shielded Metal Arc Welding(SMAW) or Manual Metal Arc Welding (MMAW)	16	-	16
5.	Gas Tungsten Arc Welding (GTAW) or Tungsten Inert Gas(TIG)	4	-	4
6.	Gas Metal Arc Welding (GMAW) or Metal Inert Gas (MIG/MAG)	4	-	4
7.	Common welding abbreviations & Terminologies	2	-	2
8.	Basic Information of Mathematics	10	-	10
9.	Basic knowledge of Engineering Drawing	10	-	10
10.	SMAW-JOINTS	-	300	300
11.	Gas tungsten arc welding (GTAW) JOINTS	-	120	120
12.	MIG- JOINTS	-	100	100
13.	Gas welding & Gas Cutting practice	-	70	70
14.	I.T Fundamentals	8	32	40
15.	Functional English	16	64	80
Total		104	696	800

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DETAIL OF COURSE CONTENTS

**Welder
(6 Months course)**


S.No	Subject main Topic	Theory Hours	Practical Hours
1.	Awareness about Safety Module-1		
	1.1 (PPE) Personal protective equipment: 1.1.1 Welding helmet 1.1.2 Face Shield 1.1.3 Gloves / apron / cap 1.1.4 Steel-capped Safety shoes 1.1.5 Goggles 1.1.6 Ear protectors 1.1.7 Safety belt etc.	4	
	1.2 Prepare workplace 1.2.1 Housekeeping and workplace preparation to start activity 1.2.2 Safe working environment and its advantages 1.2.3 Effects on Performance because of workplace	4	
	1.3 Use of Extinguishers 1.3.1 Causes of fire 1.3.2 Fire hazards 1.3.3 Processes and quick response in case of emergency 1.3.4 Types of extinguishers 1.3.4.1 Fire blanket 1.3.4.2 Water buckets 1.3.4.3 Sand buckets	4	
	1.4 Placing and caring of cylinders 1.4.1 Cylinder definition 1.4.2 Types of cylinder and uses 1.4.3 Shifting/transportation of cylinders 1.4.4 Awareness about mishandling of cylinders 1.4.5 Cylinder trolley and its function 1.4.6 Placing of gas filled cylinders 1.4.7 Proper Ventilation system		
2.	Introduction of Tools & Basic Metal work Module-2		
	2.1 Measuring Tools: 2.1.1 Steel foot rules 2.1.2 Steel T 2.1.3 Venire height gauge 2.1.4 V- block	2	

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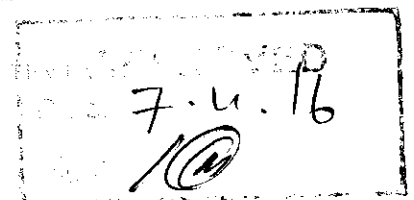
	2.1.5 Calipers (Inside caliper / outside caliper) 2.1.6 Micrometers		
	2.2 Marking Tools: 2.2.1 Steel Scribers 2.2.2 Divider 2.2.3 Centre Punch 2.2.4 Surface Gauge	2	
	2.3 Cutting Tools: 2.3.1 Shears 2.3.2 Hand Hacksaw 2.3.3 Chisels 2.3.4 Drills/Counter Sinks 2.3.5 Thread cutting Tapes & Dies	2	
	2.4 Filing Practice 2.4.1 Filing Procedure 2.4.2 File and its parts 2.4.3 Types of files 2.4.3.1 Smooth/Flat 2.4.3.2 Single cut 2.4.3.3 Double cut 2.4.3.4 Cross cut etc.	2	
	2.5 Kinds of Grinder and grinder discs 2.5.1 Grinder and their safe use 2.5.2 Types of grinder 2.5.3 Angle grinder 2.5.4 Surface grinder 2.5.5 Pencil grinder 2.5.6 Baby grinder 2.5.7 Types of Cutting discs 2.5.8 Size of Cutting discs	2	
	2.6 Hammers 2.6.1 Kinds of hammers 2.6.2 Shapes of hammers 2.6.3 Weights of hammers	1	
	2.7 Basic Metal work / Bench work 2.7.1 Organize the Bench Work Place 2.7.1.1 Select tools for job 2.7.1.2 Place tools in proper manners 2.7.1.3 Place Exercise/Drawing sheet on bench 2.7.1.4 Care the tools 2.7.1.5 Self-safety	3	

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	2.8 Preparation of job according to drawing 2.8.1 Marking according to drawing 2.8.2 Cutting (Hacksawing & Chisel) 2.8.3 Filing 2.8.4 Squaring 2.8.5 Drilling 2.8.6 Reaming 2.8.7 Countersinking 2.8.8 Counter boring 2.8.9 Threading etc.	4	10
3.	Gas Welding And Gas Cutting Module-3		
	Gas Welding / Cutting 3.1 Gas cylinders (O ₂ &C ₂ H ₂) & Acetylene generators 3.2 3O ₂ & C ₂ H ₂ Pressure Regulators for cylinders 3.3 Rubber House, Mixing Chamber 3.4 Flash back arrestors 3.5 Making of Welding Flames 3.5.1 Carburizing flame 3.5.2 Neutral flame 3.5.3 Oxidizing/Reducing flame 3.6 Welding torches /Cutting Torch 3.7 O ₂ & C ₂ H ₂ cutting flame 3.8 Spark lighter, Goggles, Burning Plier 3.9 Operating instructions for cutting torch 3.10 Cutting procedure 3.11 Care and Safety Rules 3.12 Gas Welding Techniques	4	
4.	SMAW Shielded Metal Arc Welding/ MMA Manual Metal Arc Welding Module-4		
	4.1 Explain Basic Electricity Terminology and units 4.1.1 Conductor, Electrical Circuit, Current/Ampere, Voltage, Resistance and Watt	1	
	4.2 Welding Machines 4.2.1 Types and uses of welding Machines 4.2.1.1 Transformer 4.2.1.2 Generator /DC Motor 4.2.1.3 Rectifier	2	
	4.3 Arc welding Process & its Accessories 4.3.1 SMAW Process & its safety measures 4.3.2 Name, identification and use of Arc welding Accessories	2	

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	<p>4.3.3 Cables, Electrode holder, Earth clamp, Chipping hammer, Wire brush, Eye shield, Helmet, Fire proof apron, Leather gloves etc.</p>		
	<p>4.4 Arc Welding Electrodes 4.4.1 Types of electrodes (consumable and non-consumable)</p>	2	
	<p>4.5 Polarity 4.5.1 Definition 4.5.2 Types of polarities 4.5.2.1 Straight Polarity 4.5.2.2 Reverse Polarity</p>	2	
	<p>4.6 Welding Position (For Plate Welding) 4.6.1 Flat 1G,1F 4.6.2 Horizontal 2G,2F 4.6.3 Vertical Up & Vertical Down 3G,3F 4.6.4 Over Head 4G,4F</p>	2	
	<p>4.7 Welding Position (For Pipe Welding) 4.7.1 Flat position 1G (Pipe rolled) 4.7.2 Pipes placed face to face horizontally and welder not move 4.7.3 Horizontal position 2G(Pipe fixed) 4.7.4 (Pipes placed vertically face to face to weld horizontally) 4.7.5 5G (Pipe fixed) 4.7.6 Pipes placed face to face horizontally and welder has to move for welding. 4.7.7 6G Position Pipe inclined at 45o & fixed</p>	2	
	<p>4.8 Welding Defect 4.8.1 Nomenclature 4.8.1.1 Undercut 4.8.1.2 Pin hole 4.8.1.3 Un-melted edge 4.8.1.4 Surface porosity 4.8.1.5 Poor fusion 4.8.1.6 Excess penetration 4.8.1.7 Lack of penetration 4.8.1.8 Distortion 4.8.1.9 Slag inclusion 4.8.1.10 Hot crack</p>	3	



	4.8.1.11 Cold crack (Hydrogen crack)		
5.	Gas Tungsten Arc Welding (GTAW) /Tungsten Inert Gas(TIG) Module-5		
	5.1 Gas Tungsten Arc Welding (GTAW) / Tungsten Inert Gas(TIG) 5.1.1 Introduction 5.1.2 Basic principle and its safety measures 5.1.3 Shielding gas 5.1.4 Shielding gas cylinder data 5.1.5 Description of tungsten electrodes 5.1.6 TIG Welding torch 5.1.7 TIG welding machine 5.1.8 Regulator, flow meter & accessories 5.1.9 TIG welding techniques 5.1.10 Use of filler material	4	
6.	Gas Metal Arc Welding (GMAW) / Metal Inert Gas (MIG/MAG) welding Module-6		
	6.1 Gas Metal Arc Welding(GMAW) /Metal Inert Gas (MIG/MAG)welding 6.1.1 GMAW Process & its equipment. 6.1.2 Safety rules 6.1.3 Shielding Gas 6.1.4 Gas cylinder 6.1.5 Gas regulator with flow meter 6.1.6 Wire spool 6.1.7 Wire feed motor with drive rolls 6.1.8 Wire feed control 6.1.9 MIG Torch	4	
7.	Common welding abbreviations & Terminologies Module-7		
	7.1 Welding Terminologies 7.1.1 Arc 7.1.2 Arc length 7.1.3 Electrode 7.1.4 Arc length 7.1.5 Crater 7.1.6 Polarity 7.1.7 Root gap 7.1.8 Base metal/job 7.2 Common Abbreviations 7.2.1 MAG Metal Active Gas 7.2.2 FCAW Flux Cored Arc Welding 7.2.3 SMAW Shielded Metal Arc Welding 7.2.4 PAW Pressure Arc Welding 7.2.5 MMAW Manual Metal Arc Welding	2	

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10.2	Breaking and re-starting the ArcMS 200x100x6mm 1pc		6
10.3	Stringer Bead/Blind Welding F- Position MS 200x100x6mm 1pc 3.1-Preparation 3.2-Selection of electrode 3.3-Striking/ scratching motion 3.4-Melting of Base Metal 3.5-Bead Forming 3.6-Ripple Making		10
10.4	Lap Joint F & H Position 1F & 2F (Fillet) MS 200x37x3mm 2pcs 4.1-Preparation 4.2-Selection of electrode 4.3-Overlapping 4.4-Tacking 4.5-Welding		5
10.5	T/Fillet-Joint Vertical up Position 3F MS 200x37x3mm 2pcs 5.1-Preparation 5.2-Selection of electrode 5.3-Preparation 5.4-Taking of pieces at 90° 5.5-Control Equal Legs		5
10.6	Corner Joint Over Head Position 4F MS 200x37x3mm 2pcs 6.1-Preparation 6.2-Selection of electrode 6.3-Tacking 6.4-Welding		6
10.7	Single V-Butt Joint Flat 1-G (Groove)MS 200x75x12mm 2pcs 7.1-Preparation 7.2-Selection of electrode 7.3-Tacking with equal root space 7.4-Root Bead 7.5-Melting of edges 7.6-Filling Bead 7.7-Capping Multi Bead		10
10.8	Single V-Butt Joint H Position 2-GMS 200x75x12mm 2pcs 8.1Preparation 8.2-Selection of electrode 8.3-Tacking with equal root space 8.4-Root Bead 8.5-Melting of edges 8.6-Filling Bead 8.7-Capping Multi Bead		10
10.9	Single V-Butt Joint Vertical. up/down 3-GMS 200x75x12mm 2pcs		18

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	9.1-Preparation 9.2-Selection of electrode 9.3-Preparation of root face 9.4-Root Bead 9.5-Melting of edges 9.6-Filling Bead 9.7-Capping Bead		
10.10	Single V-Butt Joint O/ H Position or 4-GMS 200x75x12mm 2pcs 10.1-Preparation 10.2-Selection of electrode 10.3-Preparation of root face 10.4-Root Bead 10.5-Melting of edges 10.6-Filling Bead 10.7-Capping Bead		10
10.11	Double V-Butt Joint Flat Position 1-GMS 200x75x20mm 2pcs 11.1-Preparation 11.2-Selection of electrode 11.3-Preparation of root face 11.4-Root Bead 11.5-Melting of edges 11.6-Filling Bead 11.7-Capping Bead		18
10.12	Pipe welding F Position 1-G (Pipe rolled)MS Ø 75x75x3mm 2pcs 12.1-Preparation 12.2-Selection of electrode 12.3-Pipe Cutting with machine 90° & 45° 12.4-Tacking 12.5-Welding		10
10.13	Pipe welding H Position 2-G (Pipe fixed)MS Ø 37x37x3mm 2pcs 13.1-Preparation 13.2-Selection of electrode 13.3-Pipe Cutting with machine 90° & 45° 13.4-Tacking 13.5-Welding		10
10.14	Pipe welding 5-G (Pipe Fixed)MS Ø 37x37x3mm 2pcs 14.1-Preparation 14.2-Selection of electrode 14.3-Pipe Cutting with machine 90° & 45° 14.4-Tacking 14.5-Welding		16
10.15	Pipe welding 6G (Pipe at 45° fixed)MS Ø 37x37x3mm 2pcs 15.1-Preparation		16


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	15.2-Selection of electrode 15.3-Pipe Cutting with machine at 45° 15.4-Tacking and fixed at 45° 15.5-Welding		
10.16	Grill Welding Pattern (Flat) 16.1-Preparation 16.2-Tacking 16.3-Straightening / Grinding		28
10.17	Pipe Welding Practice 18.1-Pipe Cutting with machine 90° & 45° 18.2-Tacking 18.3-Welding		28
10.18	Angle Iron Welding Practice (Frame making) 19.1-Angle Iron Cutting with machine 90°, 45° 19.2-Tacking 19.3-Welding		28
10.19	Stool (Square Pipe)		28
11.	GTAW Joints		
11.1	Striking of Electrode & Maintaining arc M.S/S.S/AL 150x100x2mm 1pc		8
11.2	Breaking and re-starting the Arc M.S/S.S/AL 150x100x2mm 1pc		10
11.3	Straight(Stringer) Bead Flat Position MS 200x100x6mm 1pc		18
11.4	Square Butt Joint Flat Position M.S/S.S/AL 150x100x3mm 2pcs		8
11.5	Corner Joint Flat Position M.S/S.S/AL 150x100x3mm 2pc s		8
11.6	Lap -Joint Horizontal Position 2F M.S/S.S/AL 150x100x4mm 2pc s		8
11.7	Pipe to Pipe weld flat Position M.S Ø50x75x3mm 2pcs		8
11.8	Pipe to Pipe weld F Position 1G (Pipe rolled) M.S Ø50x75x3mm 2pcs		16
11.9	Pipe to Pipe weld 5G(Pipe fixed) M.S Ø50x75x3mm 2pcs		18
11.10	Pipe welding 6-G (Pipe inclined at 45° fixed) M.S Ø50x75x3mm 2pcs		18

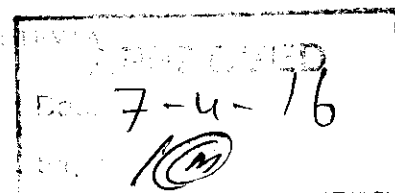
12.	MIG Joint (MIG-Joints Module-12)		
12.1	Striking of electrode		08
12.2	Blind welding joint(Flat) M.S flat 200x100x6 mm 1pc		14
12.3	Butt joint (Flat) M.S flat 200x37x6mm 2pcs		14
12.4	Corner joint (Horizontal) M.S flat 200x37x9 mm 2pcs		14
12.5	Lap joint (Vertical up) M.S flat 200x37x3mm 2pcs		16

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Welder (SMWA, GTAW, GMAW, Gas Welding & Gas Cutting) 6-Months Course 14

12.6	Butt joint (Vertical up)	M.S flat 200x37x3mm 2pcs		18
12.7	T/Fillet Joint Horizontal	M.S flat 200x50x6mm 1pc M.S flat 200x25x6mm 1pc		16

13. Gas welding Joints & gas cutting practice				
13.1	Flame making practice			12
13.2	Puddle formation M.S 200x37x3mm 1pc			4
13.3	Straight(Stringer) Bead Flat Position M.S 200x37x3mm 1pc			6
13.4	Square Butt-joint flat position M.S 200x37x3mm 2pcs			4
13.5	Lap Joint Flat Position M.S 150x100x3mm 2pcs			4
13.6	Corner Joint Flat Position M.S 200x37x3mm 2pcs			4
13.7	Butt-Joint Horizontal Position M.S 200x37x3mm 2pcs			8
13.8	Gas Cutting Practice Making grooves for different jobs for SMAW & GTAW			20
13.9	Brazing Lap joint M.S 200x37x3mm 2pcs			4
13.10	Brazing Butt joint M.S 200x37x3mm 2pcs			4
Total			80	600



LIST OF PRACTICALS

SMAW Joints

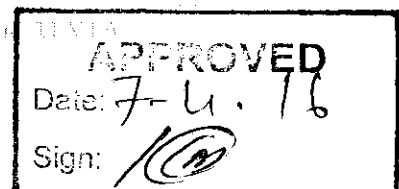
1	Striking of Electrode & Maintaining Arc
2	Breaking and re-starting the Arc
3	Stringer Bead/Blind Welding F- Position
4	Lap Joint F & H Position 1F & 2F (Fillet)
5	T/Fillet-Joint Vertical up Position 3F
6	Corner Joint Over Head Position 4F
7	Single V-Butt Joint Flat 1-G (Groove)
8	Single V-Butt Joint H Position 2-G
9	Single V-Butt Joint Vertical. up/down 3-G
10	Single V-Butt Joint O/ H Position or 4-G
11	Double V-Butt Joint Flat Position 1-G
12	Pipe welding F Position 1-G (Pipe rolled)
13	Pipe welding H Position 2-G (Pipe fixed)
14	Pipe welding 5-G (Pipe Fixed)
15	Pipe welding 6G (Pipe at 45° fixed) 2pcs
16	Grill Welding Pattern (Flat)
17	Pipe Welding Practice
18	Angle Iron Welding Practice (Frame making)
19	Stool (Square Pipe)

GTAW Joints

1	Striking of Electrode & Maintaining arc
2	Breaking and re-starting the Arc
3	Straight(Stringer) Bead Flat Position
4	Square Butt Joint Flat Position
5	Corner Joint Flat Position
6	Lap -Joint Horizontal Position 2F
7	Pipe to Pipe weld flat Position
8	Pipe to Pipe weld F Position 1G (Pipe rolled)
9	Pipe to Pipe weld 5G(Pipe fixed)
10	Pipe welding 6-G (Pipe inclined at 45° fixed)

MIG Joint

1	Striking of electrode
2	Blind welding joint(Flat)
3	Butt joint (Flat)
4	Corner joint (Horizontal)
5	Lap joint (Vertical up)
6	Butt joint (Vertical up)
7	T/Fillet Joint Horizontal



Gas welding Joints & gas cutting practice

1	Flame making practice
2	Puddle formation
3	Straight(Stringer) Bead
4	Square Butt-joint flat position
5	Lap Joint Flat Position
6	Corner Joint Flat Position
7	Butt-Joint Horizontal Position
8	Gas Cutting Practice Making grooves for different jobs for SMAW & GTAW
9	Brazing Lap joint
10	Brazing Butt joint


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SCHEME OF STUDIES

I.T. Fundamentals


S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Introduction to Computers	2	6	8
2.	Typing - Microsoft Word	4	14	18
3.	Internet & Electronic Mail	2	12	14
Total		8	32	40

Approved by the Head of the Institution, Department of ITM

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Date: 7.6.16
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DETAIL OF COURSE CONTENTS
I.T Fundamentals

S. No	Detail of Topics	Theory Hours	Practical Hours
1	<p>Introduction to Computers</p> <p>1.1 What is a computer- Definition, functions and general features?</p> <p>1.2 What is Hardware – 1.2.1 Computer parts and units 1.2.1.1 Input Unit - Keyboard, Mouse etc. 1.2.1.2 Central Processing Unit 1.2.1.3 Output Unit</p> <p>1.3 What is Software – 1.3.1 Electronic Parts of a Pc it is 1.3.1.1 Software and Its types 1.3.1.2 System Software, Application software and its functions</p> <p>1.4 Working with windows Operating System 1.4.1 How does windows desktops work? 1.4.2 Setting desktop, background and wall papers etc. 1.4.3 Viewing directories – List of files and folders different styles.</p> <p>1.5 What are the Icons, Shortcuts and other graphic, 1.5.1 How to see computer contents on different drives etc. 1.5.2</p>	2	6
2	<p>Typing and Word processing (MS Word)</p> <p>2.1 Proper way of typing correct and speedy - getting familiar with the keys</p> <p>2.2 Where to type in computer? How to save a file? How to get it back? Where to find your saved work?</p> <p>2.3 Formatting in MS Word Bold, Italic, page setup, setting shades and colors.</p> <p>2.4 Working with saved work, opening and moving files.</p> <p>2.5 How to get it printed?</p>	4	14


INITIALS CHECKED
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3	Emailing and Internet Surfing	2	12
	3.1 How to go to Internet, what is required for an internet connection etc.		
	3.2 How to use email? How to search on web? Etc		
	3.3 How to make new email account, login and logout an email account etc.?		
	3.4 Downloading and uploading attachments etc.		
Total		8	32

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LIST OF PRACTICALS
I.T Fundamentals

S. No.	Name of Practical
1.	Turn On/Off and setting of power supply
2.	Accessing The Desktop
3.	Using of Icons and Shortcuts
4.	Setting / customizing the desktop
5.	Viewing the contents of computer – Directory
6.	Setting the view of a folder
7.	Copying, Deleting and Moving Files in a folder
8.	Working with different Applications
9.	Opening MS Word for typing
10.	First lesson of Typing A S D F
11.	Second Lesson of typing J K L ;
12.	Third Lesson U I O P
13.	Fourth Lesson R E W Q
14.	Fifth Lesson N M , .
15.	Sixth Lesson V C X Z
16.	Seventh Lesson All letter using R index Finger
17.	Eighth Lesson All letter using L index Finger
18.	Formatting in MS Word Bold, Italic etc.
19.	Page Setting/ Page Layout
20.	Using Internet
21.	Opening Email, making new account
22.	Sending Receiving Emails
23.	Downloading and uploading attachments etc.

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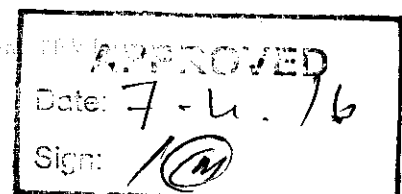
SCHEME OF STUDIES
Functional English

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Use of past indefinite tense	2	6	8
2.	Use of 'was' 'were' ' questions and negatives	3	6	8
3.	Explaining a situations/ analysis	2	6	8
4.	Communication in writing	2	6	8
5.	Comprehension	1	6	7
6.	Application/ C.V.	1	6	7
7.	Dialogues	1	9	10
8.	Understand vocabulary	1	3	4
9.	Writing complaints/ answers to complaints	1	9	10
10.	Interviews	2	7	10
Total		16	64	80

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 Date 7.4.16
 Sign (Signature)

DETAIL OF COURSE CONTENTS
Functional English

S. No	Detail of Topics	Theory Hours	Practical Hours
1	Use of past indefinite tense 1.1 Describing past events	2	6
2	Use of 'was' 'were' ' questions and negatives	2	6
3	Explaining a situations/ analysis 3.1 Making a plan 3.2 Visiting factory area 3.3 Giving justifications	2	6
4	Communication in writing 4.1 Asking for list of stationery items 4.2 Submitting report of performance of team of technicians 4.3 Submitting joining report	2	6
5	Comprehension: practice sets	2	6
6	Job application/C.V.	1	6
7	Dialogues	1	9
8	Understand vocabulary	1	3
9	Writing complaints/ answers to complaints	1	9
10	Interviews	2	7
Total		16	64



LIST OF PRACTICALS
Functional English

S. No.	Practical
1.	Group discussion
2.	Interviews
3.	Role play

7-4-16
10


LIST OF LABS

Welder

- Basic Workshop
- Welding Workshop

I.T Fundamentals

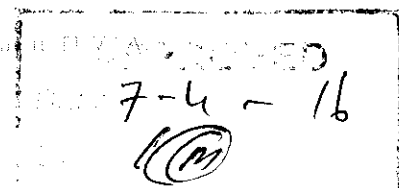
- Computer Lab

APPROVED
Date: 7-4-16
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LIST OF TOOLS / EQUIPMENT
(For a class of 25 students)


Name of Trade	Welder (SMWA, GTAW, GMAW, Gas Welding & Gas Cutting)
Name	6 - Months

S. No.	Nomenclature of Tools / Equipment	Quantity
1.	Welding transformer (50 to 450 Amp) complete with loads holder	6 Nos.
2.	Welding rectifier	6 Nos.
3.	TIG welding machine with accessories	2 Nos.
4.	MIG welding machine with accessories	2 Nos.
5.	Welding face shield	12 Nos.
6.	Welding helmet	12 Nos.
7.	Safety helmet	6 Nos.
8.	Arc welding table	12 Nos.
9.	Chipping hammer	12 Nos.
10.	Apron	12 Nos.
11.	Leather gloves (left & right)	12 sets
12.	Argon gas cylinder	4 Nos.
13.	CO2 gas cylinder	2 Nos.
14.	O2 gas cylinder	2 No.
15.	C2H2 gas cylinder	1 No.
16.	Hand Grinder	2Nos
17.	Auto bevel cutting machine	1 No.



COMPUTER LAB

S. No.	Tools / Equipment	Quantity
1.	Desktop computer (Specifications as per notification issued by MIS Section, TEVTA)	26 (1 for each student & 1 for the teacher)
2.	Printer (Laser)	01
3.	Scanner	01
4.	Internet Connection (At least 1 MB speed)	01
5.	UPS 10 KVA	01
6.	Air Conditioner 1 ½ Ton	02
7.	Multimedia Projector	01


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 Date: 7-4-16
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LIST OF CONSUMABLES**Welder**

S.No	Nomenclature of ITEMS	WEIGHT PER TRAINEE	For 25 TRAINEE
1. SMAW	MS 200x100x6mm 1pc	0.9	24
2.	MS 200x100x6mm 1pc	0.9	24
3.	MS 200x100x6mm 1pc	0.9	24
4.	MS 200x37x3mm 2pcs	0.35	9
5.	MS 200x37x3mm 2pcs	0.35	9
6.	MS 200x37x3mm 2pcs	0.35	9
7.	MS 200x75x12mm 2pcs	2.8	71
8.	MS 200x75x12mm 2pcs	2.8	71
9.	MS 200x75x12mm 2pcs	2.8	71
10.	MS 200x75x12mm 2pcs	2.8	71
11.	MS 200x75x20mm 2pcs	2.4	58
12.	MS Ø 75x75x3mm 2pcs	¼ ft.	7ft
13.	MS Ø 37x37x3mm 2pcs	1/6 ft.	5ft.
14.	MS Ø 37x37x3mm 2pcs	1/6 ft.	5ft.
15.	MS Ø 37x37x3mm 2pcs	1/6 ft.	5ft.
16. GTAW	M.S 150x100x2mm 1pc	0.23 Kg	6
17.	M.S 150x100x2mm 1pc	0.23 Kg	6
18.	MS 200x100x6mm 1pc	0.9 Kg	24
19.	M.S 150x100x3mm 2pc s	0.70	17
20.	M.S 150x100x3mm 2pc s	0.70	17
21.	M.S.24 150x100x4mm 2pc s	0.9	24
22.	M.S Ø 50x75x3mm 2pcs	0.5 ft.	13 ft.
23.	M.S Ø 50x75x3mm 2pcs	0.5 ft.	13 ft.
24.	M.S Ø 50x75x3mm 2pcs	0.5 ft.	13 ft.
25.	M.S Ø 50x75x3mm 2pcs	0.5 ft.	13 ft.
26.	S.S 150x100x2mm 1pc	0.24Kg	6
27.	S.S 150x100x2mm 1pc	0.24Kg	6
28.	S.S 150x100x3mm 2pc s	0.71	18
29.	S.S 150x100x3mm 2pc s	0.71	18
30.	S.S 150x100x4mm 2pc s	0.95	24
31.	AL 150x100x2mm 1pc	0.08	2
32.	AL 150x100x2mm 1pc	0.08	2
33.	AL 150x100x3mm 2pc s	0.24	6
34.	AL 150x100x3mm 2pcs	0.24	6
35.	AL 150x100x4mm 2pcs	0.32	8
36. GMAW	M.S flat 200x100x6 mm 1pc	0.9	24
37.	M.S flat 200x37x6mm 2pcs	0.7	18
38.	M.S flat 200x37x9 mm 2pcs	1.05	26

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Date: 7-6-16

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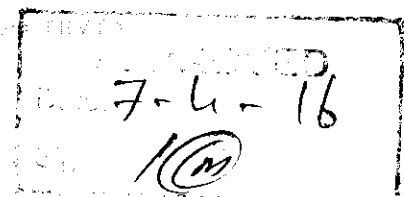
39.	M.S flat 200x37x3mm 2pcs	0.35	9
40.	M.S flat 200x37x3mm 2pcs	0.35	9
41.	M.S flat 200x50x6mm 1pc	0.5	12
	M.S flat 200x25x6mm 1pc	0.24	6
42. Gas welding	M.S 200x37x3mm 1pc	0.17	5
43.	M.S 200x37x3mm 1pc	0.17	5
44.	M.S 200x37x3mm 2pcs	0.35	9
45.	150x100x3mm 2pcs	0.7	18
46.	M.S 200x37x3mm 2pcs	0.35	9
47.	M.S 200x37x3mm 2pcs	0.35	9
48.	M.S 200x37x3mm 2pcs	0.35	9
49.	M.S 200x37x3mm 2pcs	0.35	9
50.	MS Electrode E6013 Ø2.5mm		100kg
51.	MS Electrode E 6013 Ø3.5mm		400kg
52.	MS Electrode E7018 Ø3mm		300kg
53.	Tungsten Electrode Ø1.5mm		10 Nos.
54.	Tungsten Electrode Ø2.5mm		10 Nos.
55.	MS Filler rod 2mm		20kg
56.	MS Angle Iron 1inch x1inchx3mm		100ft.
57.	MS Square bars 1inch x6mm		30kg
58.	MS Square pipe ¾ inch		100ft.
59.	MS bar Ø 6mm		
60.	Brazing Filler rod 1.5mm		5kg
61.	Brazing Flux for MS		02 Tin

Functional English

S. No.	Item	Quantity
1.	Stationary	As per requirement
2.	Board Markers	As per requirement

I.T Fundamentals

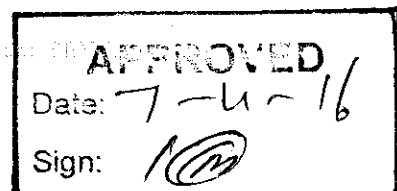
S. No.	Item	Quantity
1.	Printing Paper	As per requirement
2.	Printer Toner	As per requirement



EMPLOYABILITY OF PASS-OUTS

The pass-outs of this course may find job/employment opportunities in the following sectors / areas.

1. Construction Industry
2. Auto mobile industry
3. Repairing Work shop
4. Pakistan Ordinance Factory, Wah Cantt.
5. Heavy Mechanical Complex / Heavy Forge Foundry, Texila.
6. PECO, Kot Lakhpat.
7. DESCON Engineering.
8. Pakistan Railways Workshops.
9. Tractor manufacturing units Packages.
10. PAEC
11. Teaching.
12. Self-employment.



REFERENCE BOOKS

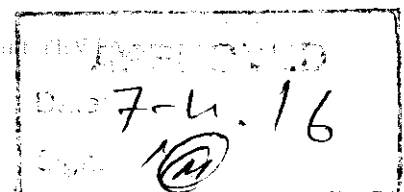
1. Health & Safety in welding (Published by the department of Labor, Wellington, New Zealand).
2. Welding Procedures and Applications by A.Banerjee
3. Principal of Welding Technology by L.M Groud
4. Welding engineering by Boniface Rossi
5. Workshop Practice-ii by Muhammad Ghayas& Muhammad Kamran
6. Engineering Drawing by N.D Bhutt.

Functional English

1. High School English Grammar By Wren & Martin
2. Oxford English Grammar

I.T Fundamentals

1. Introduction to Computer by Peter Norton
2. 2007 Microsoft® Office System Step by Step by Joyce Cox, Steve Lambert and Curtis Frye
3. Internet and E-mail with Windows 7 by Studio Visual Steps



MINIMUM QUALIFICATION OF INSTRUCTOR

Welder

- DAE in "Metallurgy & Welding Technology" with two years' experience in relevant field

OR

- Two years certificate of Welder (G-II Level) with 6 years' experience in relevant field.

Functional English

- M.A (English)

I.T Fundamentals

- DAE CIT/ BCS from HEC recognized university

DATE: 7-4-16
SIGN: [Signature]

LIST OF TRADE RELATED JARGON

Personal Protective Equipments (PPEs)
Housekeeping
Ventilation
Scribers
Divider
Hacksaw
Baby grinder
Hammers
Pressure regulators
Rubber house
Mixing chamber
Flesh back
Welding flames
Carburizing flame
Neutral flame
Oxidizing/Reducing flame
Welding torches
Cutting torch
Goggles
Spark lighter
Burning plier
Transformer
Generator /dc motor
Rectifier
SMAW process
Electrode holder
Electrode holder
Wire brush
Eye shield
Helmet
Fire proof apron
Leather gloves
Consumable electrode
Non-Consumable electrode
Polarity
Straight polarity
Reverse polarity
Welding position
Flat 1G,1F (for plate welding)
Horizontal 2G,2F for plate welding)
Vertical Up & Vertical Down 3G,3F for plate welding)
Over Head 4G,4F for plate welding)
Flat position 1G (Pipe rolled) (For Pipe Welding)
Horizontal position 2G (Pipe fixed) (For Pipe Welding)
5G (Pipe fixed) (For Pipe Welding)

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100

6G Position Pipe inclined at 45° & fixed (For Pipe Welding)
Undercut
Pin hole
Porosity
Fusion
Penetration
GTAW/ TIG
Shielding gas
Flow meter
GMAW) / (MIG/MAG)
Wire spool
Arc
Arc length
Electrode
Arc length
Crater
Root gap
Base metal/job
Beveling

7-4-16
10

Curriculum Revision Committee

1. **Muhammad Farooq,**
Sr. Instructor,
GSPCT, Gujrat

Convener

