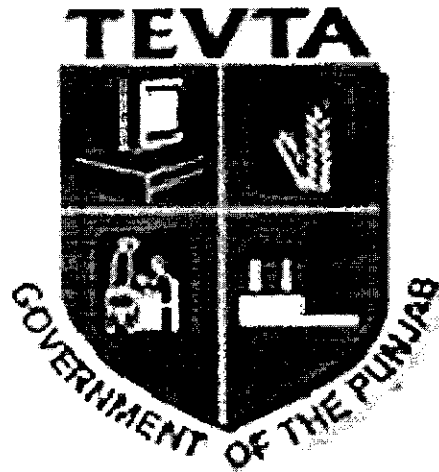


GOVERNMENT OF THE PUNJAB
TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY



CURRICULUM FOR

STEEL FIXER

(6 – Month Course)

Revised April 2016

APPROVED

Date: 7-4-16

Sign: 

CURRICULUM SECTION
ACADEMICS DEPARTMENT

96-H, GULBERG-II, LAHORE

Ph # 042-99263055-59, 99263064

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

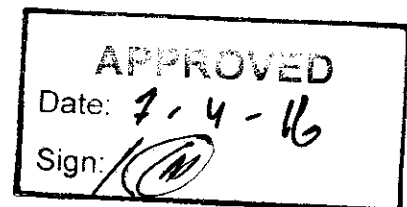
TRAINING OBJECTIVES

The objective of this course is to impart theoretical and practical knowledge about steel fixing so that the trainee may be able to work as do jobs of steel fixing for civil works and earn his livelihood by offering his skills.

At the end of the course a trainee will be familiar with basic terminology used in steel fixing, in concrete structure and structural drawing of different structural members as well as calculating cutting length of steel bar etc. Trainee will have complete command over operations like cutting, bending binding, placing of steel bar as per drawings / bar bending schedule etc.

CURRICULUM SALIENTS

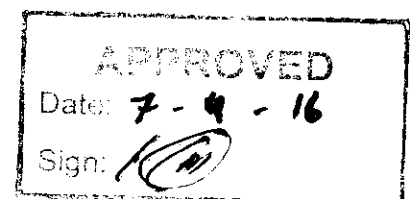
Entry Level	Middle
Duration of course	6-Month
Total training hours	800 Contact Hours
Training methodology	Practical 80% Theory 20%
Medium of instruction	Urdu/ English



SKILL PROFICIENCY DETAILS

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

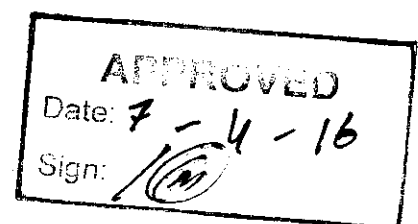
1. Use the tools and instruments for steel fixing.
2. Measure, cut and bend the bars.
3. Prepare Bends, hooks and overlaps of bars.
4. Bind the steel bars.
5. Calculate cut, length of bars / preparation of bar bending schedule.
6. Draw the structural drawing of different structural members.
7. Fix / fabricate the steel bars for different structural members of concrete structures.



KNOWLEDGE PROFICIENCY DETAILS

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

1. Explain the Selection and use of proper tools.
2. Explain the safety precautions.
3. Describe the different types of concrete and steel.
4. Describe the prerequisite of steel fixing.
5. Define the basic drawing.
6. Define the structural drawing.
7. Explain the preparation of bar bending schedule.
8. Explain the tension and compression in concrete and role of steel in concrete.
9. Describe the different terms used in concrete and steel.



SCHEME OF STUDIES
Steel Fixer
(6 - Month Course)

S. No.	Subject	Theory Hours	Practical Hours	Total Hours
1.	Steel	12	22	34
2.	Concrete	13	20	33
3.	Tools used in steel fixing	10	20	30
4.	Trade Related Mathematics	12	23	35
5.	Drawing	16	31	47
6.	Role of steel in concrete construction	13	-	13
7.	Occupational health & safety	26	-	26
8.	Measuring practice	1	20	21
9.	Cutting & bending practice	3	35	38
10.	Binding practice	4	20	24
11.	Column base	2	28	30
12.	Column	2	40	42
13.	Beams	2	30	32
14.	RCC slabs	2	40	42
15.	Retaining wall	2	30	32
16.	Raft foundation	2	30	32
17.	Pile foundation	2	40	42
18.	RCC arches	4	30	34
19.	RCC stairs	2	30	32
20.	Domes & shell structures	2	30	32
21.	RCC water tank	4	25	29
22.	I.T Fundamentals	8	32	40
23.	Functional English	16	64	80
Total		160	640	800

Developed by Curriculum Section, Academics Department TEVTA.

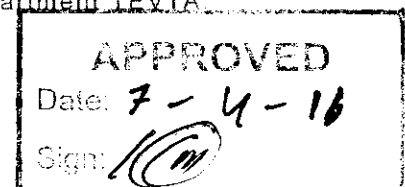
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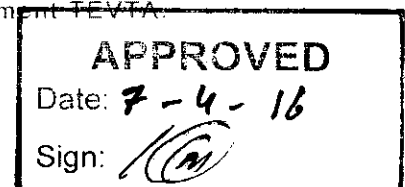
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DETAIL OF COURSE CONTENTS**Steel Fixer
(6 – Month Course)**

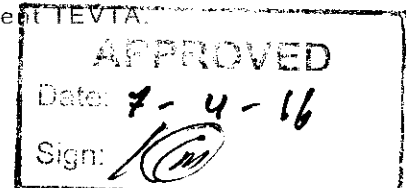
Sr. No.	Detail of Topics	Theory Hours	Practical Hours
1.	Steel 5.1. Introduction, types and Grades 5.2. Types and Sizes of bar	12	22
2.	Concrete 2.1. Introduction Types: PPC, RCC, pre-stressed concrete, precast concrete and cast in situ concrete.	13	20
3.	Tools used in Steel Fixing 3.1. Introduction to tools used in steel fixing. 3.2. Care and maintenance of tools.	10	20
4.	Trade Related Mathematics 4.1. Basic Mathematic 4.1.1. Additions & subtraction of whole number 4.1.2. Multiplication and division of whole numbers 4.1.3. Multiplication & division of fraction 4.1.4. Addition & subtraction of fraction 4.1.5. Addition & subtraction of decimal fraction 4.1.6. Multiplication & division of decimal fraction] 4.1.7. Percentage: change number to percent, change percent to decimal and fraction. 4.1.8. Solve problems related to addition, subtraction, multiplication, division and percentage. 4.2. Measurement System 4.2.1. Foot pound system of measurement 4.2.2. Parts / fraction of inches and foot 4.2.3. Metric system of measurement	12	23



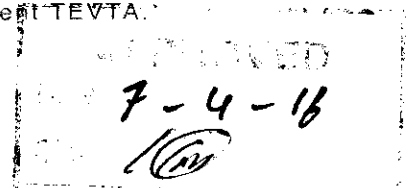
	<p>4.2.4. Multiples and parts of units</p> <p>4.2.5. Conversion of foot pound to metric system vice versa.</p> <p>4.2.6. Exercise to solve problems related to conversion, addition, subtraction and multiplication & division of measurements.</p> <p>4.3. Angles</p> <p>4.3.1. Angle and its units</p> <p>4.3.2. Types of angles</p> <p>4.3.3. Calculation (addition and subtraction etc.).</p> <p>4.4. Surface Area</p> <p>4.4.1. Surface area of rectilinear plane figures (square, rectangle, triangle, trapezium, rhombus & parallelogram etc.</p> <p>4.4.2. Surface area of angular plane figures (circle, segment, sector etc.)</p> <p>4.4.3. Practice in calculating area of different geometrical figures</p> <p>4.4.4. Pythagoras's theorem and its application</p> <p>4.4.5. Area and perimeter of composed figures</p> <p>4.4.6. Practice in calculating areas and perimeter of composed figures.</p> <p>4.4.7. Practice in calculating covered area of building from working drawing.</p> <p>4.5. Volume</p> <p>4.5.1. Volume and unit of volume</p> <p>4.5.2. Volume of geometrical solids</p> <p>4.5.3. Surface area of geometrical solids</p> <p>4.5.4. Quantity of liquid in container</p> <p>4.5.5. Practice in calculating volume and surface areas of different geometrical solid.</p>		
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	<p>4.6. Weight</p> <p>4.6.1. Weight and its units</p> <p>4.6.2. Specific weight / density</p> <p>4.6.3. Specific weight of different construction material & components</p> <p>4.6.4. Practice to calculate the weight of different materials on the basis of volume and density.</p> <p>4.7. Estimation & Wastage</p> <p>4.8. Estimating cost of formwork on the basis of surface area.</p> <p>4.9. Calculating wastage on the basis of area and length.</p> <p>4.10. Practice of solving problem regarding estimating cost of formwork.</p>		
5.	<p>Reading Drawing</p> <p>5.1. Introduction Of Drawing</p> <p>5.2. Necessity & importance of drawing</p> <p>5.3. Types of engineering drawing</p> <p>5.4. Free hand sketching</p> <p>5.4.1. Types and material for free hand sketching</p> <p>5.4.2. Sketching of lines and geometrical figures</p> <p>5.4.3. Exercise to draw different lines, circle, ellipse, triangle, rectangle & polygons.</p> <p>5.4.4. Free hand pictorial sketching</p> <p>5.4.5. Exercise to draw pictorial sketches of different wooden blocks</p> <p>5.5. Scales</p> <p>5.5.1. Types and uses of scales</p> <p>5.5.2. Reading exercise of different scales</p> <p>5.6. Building Drawing Symbols</p> <p>5.6.1. Alphabet of lines</p>	16	31



	<p>5.6.2. Symbol for material, door, windows, plumbing, electrical fitting and fixture</p> <p>5.7. Technical Term Used In Building</p> <p>5.7.1. Structural terms</p> <p>5.7.2. House planning term (corridor, balconies, powder, pantry etc.)</p> <p>5.8. Building Drawing</p> <p>5.8.1. Presentation & Working drawings</p> <p>5.8.2. Brief introduction to plans, elevation & section</p> <p>5.8.3. Reading exercise of working and structural drawings of different buildings</p> <p>5.9. Introduction of Building Materials</p> <p>5.9.1. Cement; types and properties</p> <p>5.9.2. Sand; types and properties</p> <p>5.9.3. Aggregate; types and properties</p> <p>5.9.4. Bricks; types and properties</p> <p>5.9.5. reinforcement; types and properties</p> <p>5.10. Components of Building</p> <p>5.11. Foundation</p> <p>5.11.1. Spread footing</p> <p>5.11.2. Column footing</p> <p>5.11.3. Deep foundation</p> <p>5.11.4. Walls</p> <p>5.11.5. Columns</p> <p>5.11.6. Beams</p> <p>5.11.7. Lintels & sunshade</p> <p>5.11.8. Roof slab</p> <p>5.11.9. Stair case</p> <p>5.11.10. Arches</p> <p>5.11.11. Floors</p>		
6.	Role of Steel in concrete construction	13	-

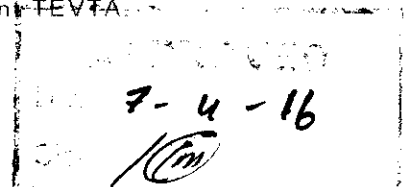


	6.1. Tension and compression in concrete, bends, hooks and overlaps of bars , Concrete cover, effective depth, overall depth, main bars, distribution bars, stirrups, dowel bars, chairs and effective span etc.		
7.	Occupational Health & safety. 7.1. Personal safety, safety helmet, dongri safety, shoes, goggles and safety belts. 7.2. Safety precautions during steel bending, cutting and fixing / fabrication 7.3. First Aid	26	-
8.	Measuring Practice 8.1. Measuring the diameter of the bar and length of bars. 8.2. Quality control while cutting the bars.	1	20
9.	Cutting & Bending Practice 9.1. Cutting practice of different types and sizes of steel bar. 9.2. Practice of making hooks and bends. 9.3. Practice of making bend up bar at 45° , 30°	3	5
10.	Binding Practice 10.1. Introduction to binding wires (size, quality). 10.2. Different methods of binding the bars. 10.3. Practice of bar binding with binding wire.	4	20
11.	Column Base 11.1. Introduction of structure drawing of column base 11.2. Calculation of cut lengths of bars (as like bars bending schedule) 11.3. Practice of cutting, making bands, placing and binding of steel bars for column base as per drawing or bar bending schedule	2	28

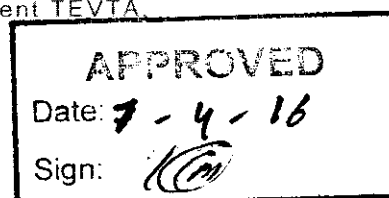


12.	Column 12.1. Introduction of Structural Drawing of column 12.2. Calculation of cut lengths and no of bars and stirrups / rings for simply supported column (as like bars bending schedule) 12.3. Practice of making ring / stirrups as per drawing. 12.4. Practice of cutting, making bends, placing and binding of steel bars and ring / stirrups for column as per drawing or bar bending schedule	2	22
13.	Beams 13.1. Introduction of structural drawing of simply supported continuous and cantilever beam. 13.2. Calculation of cut lengths and no of bars for simply supported beam. (as like bars bending schedule) 13.3. Practice of cutting, making bends, bend-up bars and stirrups, placing and binding of steel bars for simply supported beam as per drawing or bar bending schedule. 13.4. Calculation of cut lengths bars and stirrups and no of bars for continuous beam (as like bars bending schedule) 13.5. Practice of cutting, making bands, stirrups and bend-up, placing and binding of steel bars for continuous beam as per drawing or bar bending schedule.	2	30
14.	RCC Slabs 14.1. Introduction of structural drawing of slabs (simply supported, continuous, cantilever). 14.2. Calculation of cut lengths and no of bars for simply supported and cantilever slab. (as like bars	2	40

	<p>bending schedule)</p> <p>14.3. Practice of cutting, making bends and bend-up bars, placing and binding of steel bars for simply supported slab as per drawing or bar bending schedule.</p> <p>14.4. Practice of cutting, making bends and bend-up bars, placing and binding of steel bars for cantilever slab as per drawing or bar bending schedule.</p>		
15	<p>Retaining Wall</p> <p>15.1. Study of structural drawing of retaining wall</p> <p>15.2. Calculation of cut lengths, curtailing and no of bars for R.C.C retaining wall. (as like bars bending schedule)</p> <p>15.3. Practice of cutting, making bends placing and binding of steel bars for R.C.C retaining wall as per drawing or bar bending schedule.</p>	2	30
16	<p>Raft Foundation</p> <p>16.1. Introduction of structural drawing of Raft foundation.</p> <p>16.2. Calculation of cut lengths, and no of bars for Raft foundation (as like bars bending schedule)</p> <p>16.3. Practice of cutting, making bends, chairs, placing and binding of steel bars for Raft foundation as per drawing or bar bending schedule.</p>	2	30
17	<p>Pile Foundation</p> <p>17.1. Introduction of structural drawing of pile foundation.</p> <p>17.2. Calculation of cut lengths of bars and rings and no of rings for a small pile (as like bars bending schedule)</p> <p>17.3. Practice of making rings for pile.</p>	2	40



	17.4. Fabrication of cage for small as per drawing.		
18.	RCC Arches 18.1. Introduction of structural drawing of RCC Arch and calculation of cut length and no of bars etc. 18.2. Practice of cutting, bending, placing and binding of bars for R.C.C Arch as per drawing or bar bending schedule	4	30
19.	RCC Stairs 19.1. Introduction of structural drawing of different types of R.C.C stairs. 19.2. Calculating of cut lengths and no of bars for single flight stair. 19.3. Practice of cutting, bending placing and binding of bars for single flight stair. 19.4. Calculating of cut lengths and no of bars for dog legged stair. 19.5. Practice of cutting, bending, making stirrups/ rings placing and binding of bars for dog legged stair	2	30
20.	Domes & Shell Structures 20.1. Introduction of structural drawing of dome and shell structure and study of bar bending schedule. 20.2. Practical of cutting bending, placing & binding of steel bars for of dome and shell structure.	2	30
21.	RCC Water Tank 21.1. Introduction of structural drawing of water tank. Study of bar bending schedule. 21.2. Practical of cutting bending, placing & binding of steel bars for a small water tank	4	25
TOTAL		136	544



LIST OF PRACTICALS

S. No.	Name of Practical's
1.	Measuring the job according to Drawings / size
2.	Practice for using of measuring instruments
3.	Practice for using different tools in steel fixing
4.	Practice for reading drawings
5.	Practice for free hand sketching and scales
6.	Practice for use of safety tools during work.
7.	Practice for cutting of steel bars different dia.
8.	Practice for hooks and bend up bars.
9.	Practice for preparing rings according to size.
10.	Practice for binding of steel bars of column base
11.	Practice for binding of steel bars for column
12.	Practice for binding of steel bars for beams
13.	Practice for binding of steel bars for R.C.C Slabs
14.	Practice for binding of steel bars for Retaining wall.
15.	Practice for binding of steel bars for Raft Foundation
16.	Practice for binding of steel bars for Pile Foundation
17.	Practice for binding of steel bars for R.C.C Arch
18.	Practice for binding of steel bars for R.C.C Stairs
19.	Practice for binding of steel bars for R.C.C domes
20.	Practice for binding of steel bars for R.C.C shell structures
21.	Practice for binding of steel bars for R.C.C water tanks
22.	Practice for safety measures

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SCHEME OF STUDIES
I.T. Fundamentals

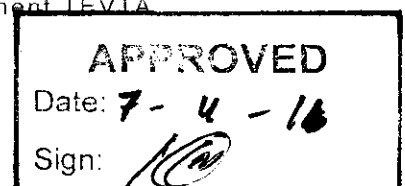
S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Introduction to Computers	2	6	8
2.	Typing - Microsoft Word	4	14	18
3.	Internet & Electronic Mail	2	12	14
Total		8	32	40

Developed by Curriculum Section, Academics Department TEVTA


APPROVED Date: 7-4-16 Sign: 
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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.</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</p>	4	14

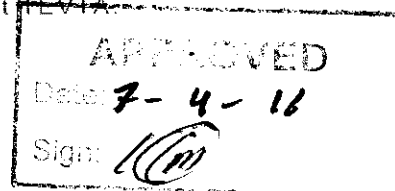


	files.		
	2.5 How to get it printed?		
3	Emailing and Internet Surfing	2	12
	3.1 How to go to Internet, what is required for an internet connection etc.		
	3.2 How to use email? How to search on web? Etc		
	3.3 How to make new email account, login and logout an email account etc.?		
	3.4 Downloading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

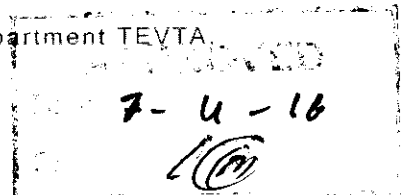
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LIST OF PRACTICALS
I.T Fundamentals

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.



SCHEME OF STUDIES
Functional English

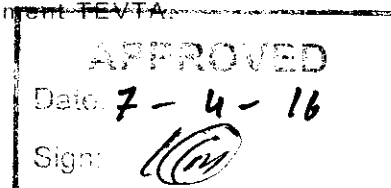
S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Use of past indefinite tense	2	6	8
2.	Use of 'was' 'were' ' questions and negatives	3	6	8
3.	Explaining a situations/ analysis	2	6	8
4.	Communication in writing	2	6	8
5.	Comprehension	1	6	7
6.	Application/ C.V.	1	6	7
7.	Dialogues	1	9	10
8.	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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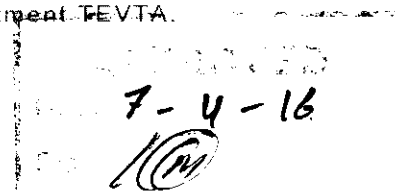
DETAIL OF COURSE CONTENTS
Functional English

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



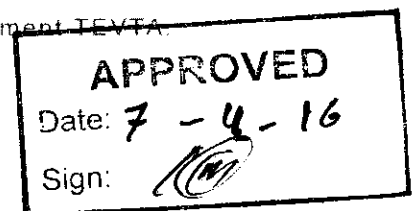
LIST OF LABS

Steel Fixer

- Steel / Metal Workshop
- Drawing Hall

I.T Fundamentals

- Computer Lab




LIST OF TOOLS & EQUIPMENT
(FOR CLASS OF 25 STUDENTS)

Name of Trade	Steel Fixer
Duration of Course	6 – Months

S. No.	Nomenclature of Equipment / Tools	Quantity
Tools / equipment for cutting, bending		
1.	Chisels (for cutting steel)	30
2.	Hammers (Heavy)	10
3.	Hammers (Light)	05
4.	Cutting bare	06
5.	Calipers	06
6.	Measuring Tapes (100')	10
7.	Pliers	10
8.	Tonge (Sunny)	10
9.	Bending Rods (Bari)	06
10.	Tool Sharpening machine	01
11.	Bending machine with table (4' x 6')	06
12.	Cutting machine with cutters	06
13.	Bench vice	01
14.	Gloves	30 Pans
15.	Pincer	06
16.	Computer (P-IV)	12
17.	Printer (Black & White)	01
18.	Multi Media	01

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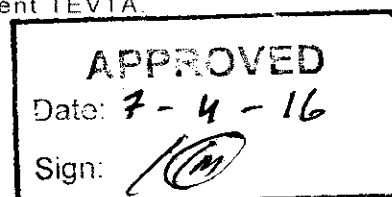
19.	Computer Tables	14
20.	Computer Chairs / Stools	25

LIST OF MACHINES

S. No.	Nomenclature of Machines	Quantity
1.	Steel cutting Machine	1
2.	Steel Bending Machine	1
3.	Steel Platform for bending and cutting	2

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



LIST OF CONSUMABLE MATERIALS

(For Class of 25 Students)

S. No.	Items	Quantity
1.	Steel ¾" dia	450 kg
2.	Steel ½" dia	600 kg
3.	Steel ¼" dia	350 kg
4.	Binding wire	50 kg
5.	White papers for printer	03 - Rim
6.	Graph Papers	100 sheets

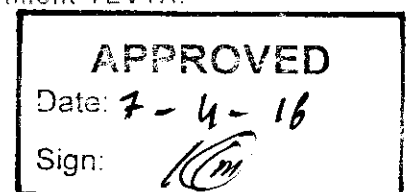
Functional English

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

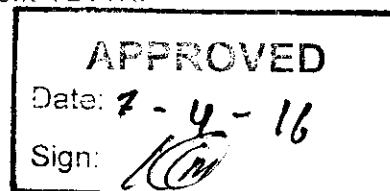
Developed by Curriculum Section, Academics Department TEVTA.



EMPLOYABILITY OF PASS OUTS

After completion of course the trainee may find job / employment in the following areas/sectors:

1. Work as steel fixer in R.C.C. structures with contractors.
2. Work as steel fixer with public sector construction companies.
3. Work as steel fixer with construction companies abroad.
4. All Mechanical / Civil work Industries & Chemical Industries etc.



MINIMUM QUALIFICATION OF INSTRUCTOR

- DAE in (Civil / Mechanical) Technology With 2-Years relevant experience.

OR

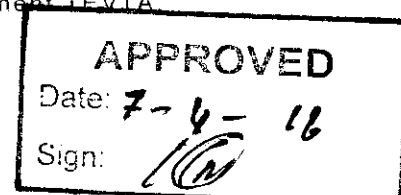
- Two Years certificate of Steel Fixer with 6-Years' experience in relevant field.

Functional English

- M.A (English)

I.T Fundamentals

- DAE CIT/ BCS from HEC recognized university



REFERENCE BOOKS

1. Instructor Manual & Trainee Manual
2. G-III Level (Development Cell)
3. Steel Fixer by Mr. Ikhlas Khan

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

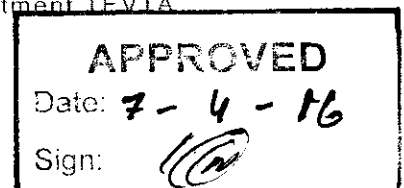
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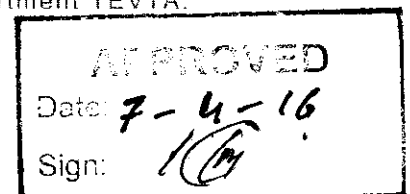
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LIST OF TRADE RELATED JARGON

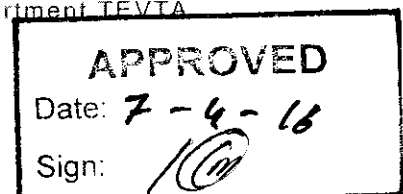
Alloy steels	Alloy steels have enhanced properties due to the larger proportion of elements such as manganese and silicon present in carbon steels.
Annealing	The heat treatment process by which steel products are reheated to a suitable temperature in order to remove stresses from previous processing and to soften them and/or improve their machinability and cold forming properties.
Apparent consumption	The sum of net industry shipments within a given country or region, plus its imports and minus its exports.
Bar	A finished steel product, commonly in flat, square, round or hexagonal shapes. Rolled from billets, bars are produced in two major types: merchant and special.
Billet	A semi-finished steel product with a square cross section
Blank	Steel sheet of high dimensional precision, in simple or complex form,
Blast furnace	A furnace used in integrated steelmaking in which coke and iron ore react together under a hot air flow to form liquid hot metal, also called pig iron.
Carbon steel	A type of steel that generally has only a small quantity of elements other than carbon, silicon, manganese, sulphur and phosphorus, so it has no significant alloying element.
Coal	The primary fuel used by integrated iron and steel producers.
Coated steels	Steel is coated by a heat process, or through electrolysis, with a layer to protect the metal base against corrosion.
Coil	A finished steel product such as sheet or strip which has been wound or coiled after rolling.
Coke	A form of carbonized coal burned in blast furnaces to reduce iron ore pellets or other iron-bearing materials iron.
Coke ovens	Ovens where coke is produced.
Cold rolling	Passing a sheet or strip that has previously been hot rolled and picked through cold rolls.
CRC	Cold rolled coil (see cold rolling)



Crude steel	Steel in the first solid state after melting, suitable for further processing or for sale. Synonymous with raw steel.
Direct reduction	A group of processes for making iron from ore without exceeding the melting temperature. No blast furnace is needed.
Electrical steels	Specially manufactured cold rolled sheet and strip containing silicon, processed to develop definite magnetic characteristics for use by the electrical industry.
Flat products	A type that is produced by rolls with smooth surfaces and ranges of dimension, varying in thickness.
Galvanized steel	Produced when hot or cold rolled sheet or strip is coated with zinc,
HDG	Hot dip galvanized
Hot and cold rolling mill	Hot-rolling mill: Equipment on which solidified steel preheated to a high temperature is continuously rolled between two rotating cylinders.
Hot metal	Molten iron produced in the blast furnace.
HRC	Hot rolled coil (see hot rolling)
Iron ore	The primary raw material in the manufacture of steel.
Limestone	Used by the steel industry to remove impurities from the iron made in blast furnaces.
Open-hearth process	A process for making steel from molten iron and scrap. The open-hearth process has been replaced by the basic oxygen process in most modern facilities.
Pellets	An enriched form of iron ore shaped into small balls.
Pig Iron	The product that results from smelting iron ore with a high-carbon fuel such as coke
Plate	A flat rolled product from slabs or ingots of greater thickness than sheet or strip.
Refining stand	A stage in the process of making crude steel, during which the crude steel is further refined
Rolling mill	Equipment that reduces and transforms the shape of semi-finished



Sheet	A flat rolled product over 12 inches in width and of less thickness than plate.
Sheet piling	Rolled sections with interlocking joints
Sinter plant	A plant in which iron ore is crushed,
Sintering	A process which combines ores too fine for efficient blast furnace use with flux stone.
Slab	A semi-finished steel product obtained by rolling ingots on a rolling mill.
Slag	A by-product, containing inert materials from the 'burden' that is produced during the melting process.
Sponge iron	The product of the direct reduction process. Also known as direct reduced iron (DRI).
Stainless steels	Stainless steels are distinguished from carbon steel
Standard pipe	Used for low-pressure conveyance of air, steam, gas, water, oil
Strip	Flat steel coil products,
Tin coated steel	Cold rolled sheet, strip or plate coated with tin or chromium.
Wire rods	Coiled bars of up to 18.5 millimetres in diameter, used mainly in the production of wire.



Curriculum Revision Committee

1. **Engr. Mazhar Abbas Naqvi** **Convener**
Principal,
Govt. Staff Training College, Faisalabad

2. **Mr. Amjad Rafique,** **Member**
Sr. Instructor,
GCT Rasul

