GOVERNMENT OF THE PUNJAB

TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY

CURRICULUM FOR

STEEL FIXER

(3 – Month Course)

CURRICULUM SECTION

ACADEMICS DEPARTMENT

96-H, GULBERG-II, LAHORE

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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	3-Month
Total training hours	300 Hours
	25 Hours per week
	6 Days per Week
Training methodology	Practical 90%
	Theory 10%
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

(3 - Month Course)

Sr. No.	Subject	Theory Hours	Practical Hours	Total Hours
1.	Steel	1	1	2
2.	Concrete	1	-	1
3.	Tools used in steel fixing	1	-	1
4.	Basic arithmetic	2	6	8
5.	Measurement system	2	3	5
6.	Basic mansuration	3	9	12
7.	Building drawing	2	3	5
8.	Role of steel in concrete construction	3	-	3
9.	Occupational health & safety	3	-	3
10.	Measuring practice	½	6	6 ½
11.	Cutting & bending practice	1	21	22
12.	Binding practice	½	6	6 ½
13.	Column base	1	12	13
14.	Column	1	21	22
15.	Beams	1	30	31
16.	RCC slabs	1	25	26
17.	Retaining wall	1	15	16
18.	Raft foundation	1	15	16
19.	Pile foundation	1	25	26
20.	RCC arches	½	12	12 ½
21.	RCC stairs	1	27	28
22.	Domes & shell structures	1	15	16
23.	RCC water tank	½	12	12 ½
24.	Work Ethics	0	12	12
Total		**30**	**270**	**300**

DETAIL OF COURSE CONTENTS

Steel Fixer

(3 – Month Course)

Sr. No.	Detail of Topics	Theory Hours	Practical Hours
1.	**Steel** 1.1. Introduction, types and Grades 1.2. Types and Sizes of bar	1	1
2.	**Concrete** 2.1. Introduction Types: PPC, RCC, prestressed concrete, precast concrete and cast in situ concrete.	1	-
3.	**Tools used in Steel Fixing** 3.1. Introduction to tools used in steel fixing. 3.2. Care and maintenance of tools.	1	-
4.	**Basic Arithmetic** 4.1. Exercise of Addition, subtraction, division & multiplications of whole member, fractions and decimals 4.2. Angles laying 30°, 45°, 90° angles	2	6
5.	**Measurement System** 5.1. Foot pound system, part / fractions of inches and feet 5.2. Metric system of measurements 5.3. Conversion of foot pound to metric system vise versa. 5.4. Exercise to solve problem regarding addition & subtraction of measurements.	2	3
6.	**Basic Mansuration** 6.1. Area of rectilinear plane geometrical figures & circle practice in calculating areas of different plain	3	9

	figure. 6.2. Volume of simple geometrical solids. Practice in calculating volume different geometrical solids. 6.3. Weight & specific weight. Practice to calculate weight of different materials on the b basic of volume and density.		
7.	**Building Drawing** 7.1. Term used in building, structure, terms, hours planning terms. 7.2. Components of building. 7.3. Introduction to plan, elevation & section, types of drawings. 7.4. Reading exercise of working & structure drawing of different building.	2	3
8.	**Role of Steel in concrete construction** 8.1. 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.	3	-
9.	**Occupational Health & safety.** 9.1. Personal safety, safety helmet, dongri safety, shoes, goggles and safety belts. 9.2. Safety precautions during steel bending, cutting and fixing / fabrication 9.3. First Aid	3	-
10.	**Measuring Practice** 10.1. Measuring the diameter of the bar and length of bars. 10.2. Quality control while cutting the bars.	½	6

11.	**Cutting & Bending Practice** 11.1. Cutting practice of different types and sizes of steel bar. 11.2. practice of making hooks and bends. 11.3. Practice of making bend up bar at 45^{o} , 30^{o}	1	3 9 9
12.	**Binding Practice** 12.1. Introduction to binding wires (size, quality). 12.2. Different methods of binding the bars. 12.3. Practice of bar binding with binding wire.	½	6
13.	**Column Base** 13.1. Introduction of structure drawing of column base 13.2. Calculation of cut lengths of bars (as like bars bending schedule) 13.3. Practice of cutting, making bands, placing and binding of steel bars for column base as per drawing or bar bending schedule	1	 3 9
14.	**Column** 14.1. Introduction of Structural Drawing of column 14.2. Calculation of cut lengths and no of bars and stirrups / rings for simply supported column (as like bars bending schedule) 14.3. Practice of making ring / stirrups as per drawing. 14.4. Practice of cutting, making bends, placing and binding of steel bars and ring / stirrups for column as per drawing or bar bending schedule	1	 4 8 9
15.	**Beams** 15.1. Introduction of structural drawing of simply supported continuous and cantilever beam. 15.2. Calculation of cut lengths and no of bars for simply supported beam. (as like bars bending schedule)	1	 3

	15.3. 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. 15.4. Calculation of cut lengths bars and stirrups and no of bars for continuous beam (as like bars bending schedule) 15.5. 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.		12 3 12
16.	**RCC Slabs** 16.1. Introduction of structural drawing of slabs (simply supported, continuous, cantilever). 16.2. Calculation of cut lengths and no of bars for simply supported and cantilever slab. (as like bars bending schedule) 16.3. 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. 16.4. 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.	1	4 9 12
17	**Retaining Wall** 17.1. Study of structural drawing of retaining wall 17.2. Calculation of cut lengths, curtailing and no of bars for R.C.C retaining wall. (as like bars bending schedule) 17.3. Practice of cutting, making bends placing and	1	3 12

	binding of steel bars for R.C.C retaining wall as per drawing or bar bending schedule.		
18	**Raft Foundation** 18.1. Introduction of structural drawing of Raft foundation. 18.2. Calculation of cut lengths, and no of bars for Raft foundation (as like bars bending schedule) 18.3. Practice of cutting, making bends, chairs, placing and binding of steel bars for Raft foundation as per drawing or bar bending schedule.	1	 3 12
19	**Pile Foundation** 19.1. Introduction of structural drawing of pile foundation. 19.2. Calculation of cut lengths of bars and rings and no of rings for a small pile (as like bars bending schedule) 19.3. Practice of making rings for pile. 19.4. Fabrication of cage for small as per drawing.	1	 4 9 12
20.	**RCC Arches** 20.1. Introduction of structural drawing of RCC Arch and calculation of cut length and no of bars etc. 20.2. Practice of cutting, bending, placing and binding of bars for R.C.C Arch as per drawing or bar bending schedule	½	 3 9
21.	**RCC Stairs** 21.1. Introduction of structural drawing of different types of R.C.C stairs. 21.2. Calculating of cut lengths and no of bars for single flight stair. 21.3. Practice of cutting, bending placing and binding of bars for single flight stair.	1	 3 9

	21.4. Calculating of cut lengths and no of bars for dog legged stair. 21.5. Practice of cutting, bending, making stirrups/ rings placing and binding of bars for dog legged stair		3 12
22.	**Domes & Shell Structures** 22.1. Introduction of structural drawing of dome and shell structure and study of bar bending schedule. 22.2. Practical of cutting bending, placing & binding of steel bars for of dome and shell structure.	1	3 12
23.	**RCC Water Tank** 23.1. Introduction of structural drawing of water tank. Study of bar bending schedule. 23.2. Practical of cutting bending, placing & binding of steel bars for a small water tank	½	 12
24.	**Work Ethics**	-	12
TOTAL		**30**	**270**

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

Name of Trade	Steel Fixer
Duration of Course	3 – Months

Sr. 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 (Sunhy)	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

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.

STANDING OPERATING PROCEDURE FOR EVALUATION OF SHORT COURSE STUDENTS AGREED BY PBTE. WIDE NO. PBTE/ACD/2002/6585 DATED 09-12-2002

Following procedure will be followed for the evaluation of students of short courses: -

1. Admitted students will be registered with the Punjab Board of Technical Education Lahore within one month after the last date of admission.

2. The testing of the students shall be carried out as follows: -

a. Grading System (Theory & Practical).

A+	Grade from 80% and above.
A	Grade from 70% to 79%.
B	Grade from 60% to 69%
C	Grade from 50% to 59%
F	Less than 50%.
Fail	Below 40% in Theory & 50% in Practical

- Candidate has to pass both Theory & Practical

b. Attendance.

Students below 80% attendance will not be admissible to appear in examination.

c. Examining Body.

Punjab Board of Technical Education, Lahore will be the Testing and Evaluation Authority.

d. Testing.

1. Conduct. The testing shall be conducted in respective institutions under overall supervision of PBTE.

2. *Methodology.*

Following testing methodology will be adopted:-

(a)	Class attendance / participation	=	10%
(b)	Sessional Performance	=	40%
	(Practical exercises/ quizzes / assignments).		
(c)	Final Exams.		
	I Theory	=	10%
	II Practical.	=	40%

Total = 100%

3. The institute concerned will forward the result of students to Punjab Board of Technical Education Lahore on TEV/CURR/F-1 form (Attached) within seven days of termination of course.

4. Punjab Board of Technical Education will process the result carrying out its scrutiny / vetting and issue certificate to successful candidates as per specimen attached.

5. The secretary PBTE will sign the certificate.

6. **Miscellaneous**

a. Registration Fee

No registration fee will be taken from short course students for the time being.

b. Examination Fee

An examination fee of Rs. 50/- per student will be charged.

TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY

INDIVIDUAL EVALUATION PROFORMA

Name of Institution_____**Zone**_____**District**_____ **Trade**_____**Session**_____**From**_____**to**_____	Training Hours		
	Theory	**Practical**	**Total** .....

Sr. No.	**Roll No.**	**PBTE Registration No.**	Name	**Father's Name**	**Attendance** 10	**Sessional Performance** 40	**Final Evaluation** Theory 10	Practical 40	**Total Marks** 100	**Grade**	**Pass / Fail**	**Sr.No. of Certificate / Diploma**
1												
2												
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Prepared By Check by: Principal	All entries in this sheet checked and corrections made where necessary Name and Signatures of Scrutinizers with date: 1_____ 2_____	In case of any difference, actual marks of all the above elements are to be adjusted as per above allocation **Controller of Examinations PBTE**	Number of Candidates passed Number of Candidates failed **Grading Criteria** A+ 80% above A 70-79% B 60-69% C 50-59% F Less than 50%