GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

Course Title: Civil Engineering Workshop Practice
Course Code: 3320603

Diploma Programmes in which this course is offered	Semester in which offered
Civil Engineering, Environment Engineering, Transportation Engineering	Second Semester

1. RATIONALE

Civil diploma technician is expected to have basic skills in, Carpentry, Masonry, Welding, Fitting, Drilling, Tapping, plumbing works etc. Therefore, students should be given basic practices of these skills with the safety aspects required for the same.
The course of Civil Engineering Workshop Practices would facilitate the development of basic skills a Diploma holder is expected to posses. He/she should be able to supervise construction activities like brick masonry, woodwork, concerting, welding, finishing etc. including quality control and maintenances of safety to self, coworkers and the constructed components of the building.
The students are advised to practice each of the experiences with an understanding of necessary technical aspects and safety precautions needed to be observed.

2. COMPETENCIES

The content should be taught and implemented with the aim to develop skills so that students are able to acquire following competencies

i. **Perform basic tasks in Masonry, Concreting, Carpentry, Welding, Fitting, Drilling, Tapping, Plumbing and False Ceiling Works etc**

ii. **Follow safety norms for handling materials, tools and equipments required for each construction activity**

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	100
0	0	4	4	0	0	40	60	

Legends: L-Lecture; **T** – Tutorial/Teacher Guided Student Activity; **P** - Practical; **C** – Credit;; **ESE** - End Semester Examination; **PA** - Progressive Assessment.

Note: It is the responsibility of the institute heads that marks for **PA of theory** & **ESE and PA of practical** for each student are entered online into the GTU Portal at the end of each semester within the dates specified by GTU.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I **Civil Engineering Activities At Construction Site**	1a.Develop basic technical know-how of construction activities 1b. Inspect Construction Site	• Construction activities such as excavation, brick masonry, concreting, carpentry, welding, plumbing, etc. • Importance and Interdependency of various activities • Technical aspects involved in workmanship and Safety precautions
Unit– II **Masonry and Concreting**	2a. Apply basic techniques for masonry and concreting works 2b. Use quality control measures	• Brick and stone Masonry work, Different type of joints/bonds, Concept of line, plumb, right angle and water level. • Plastering, Pointing, • Flooring, Skirting and Dado • Concrete Laying: Proper Mixing of concrete, Use of tools like concrete mixtures and vibrators, different types of vibrators. -Formwork -Scaffolding -Centering/ Shuttering
Unit– III **Carpentry, Welding and Drilling work**	3a. Identify appropriate materials required for each activity 3b. Select appropriate tools and equipments involved in various activities for specific uses	• Types of woods/timber, different types of tools, machines and accessories for wood works • Types of welding, ARC welding, Gas welding, Gas Cutting, welding of dissimilar materials, Selection of welding rod material, welding processes. • Fitting operation like chipping, filing, right angle, marking, drilling, tapping etc. • Drilling machine. • Safety precautions in carpentry, welding, fittings safety equipments and its use in
Unit– IV **Plumbing**	4a. Install the plumbing and fixtures in buildings 4b. Observe the technical aspects involved in workmanship of various plumbing tasks 4c. Observe the safety precautions	• Different types of pipes, joints, taps, fixtures and accessories used in plumbing. • Components (pipes, bends, chambers etc.) used in sanitary/sewerage lines • Scheme/plan for water supply and sanitary system for a simple residential building.
Unit– V **Finishing Works**	5a. Provide and fix the false ceiling , aluminum –glass works 5b. Carry out whitewashing and painting	• False ceiling, POP work, aluminum –glass works • Whitewashing and painting: brush, roller and spray painting, types of finishing, preparation of surface, need of primer for timber, steel and plastered surface.

NOTE: There is no provision for lecture classes for above theoretical inputs. These theoretical inputs have to be given before practical in the workshop or sites where material/tools/equipments are available and being used. The focus of these theoretical inputs should be how to use these equipment/tools, sequence of steps for different tasks and how to perform them with safety and quality.

5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Not Applicable

6. SUGGESTED LIST OF EXERCISES/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills so that students are able to acquire above mentioned competencies. Following is the list of practical/exercises for guidance.

S. No.	Unit No.	Practical Exercises	Approx. Hours Required
1.	I, II and IV	Visit a nearby site where construction is at initial stage and observe for following (if necessary visit two/three times with a gap of a week). If drawings are available relate/match activities with the drawings. (a) Digging and filling (b) Foundation preparations (c) Brick/stone masonry (d) Concrete laying and Curing (e) Laying of sewerage/sanitary lines (f) Bar bending and bar laying for columns, beams and ceiling. (g) Onsite testing for quality (h) Onsite preparation for construction work (i) Erection and removal of form work, scaffolding, centering/shuttering Prepare a brief report on construction activities observed and methods, tools, equipment and materials being used.	**08**
2.	All	Visit a nearby site where construction is at advance stage and observe for following (if necessary visit two/three times with a gap of a week) : (a) Plumbing (b) Welding , fittings, (c) Plastering (d) Flooring (e) POP work Prepare a brief report on construction activities observed and material, tools, equipment and methods being used.	**08**
3.	I, III and V	Visit a nearby site where construction work is at finishing stage and observe for following (if necessary visit two/three times with a gap of a week): (a) Carpentry work (b) False ceiling and aluminum –glass works (c) White washing/painting work (surface preparation being carried out for timber/steel/plastered surface.) Prepare a brief report on construction activities observed and material, tools, equipment and methods being used.	**08**

4.	II	Assemble a brick wall of 120 cm length and 20 cm thickness and 60 cm height by arranging bricks in different bonds (using only wet mud as mortar). Ensure that wall is in line, plumb and at right angle to a given structure. (Group of 10 students)	**04**
5	II	Mark level of given height from ground level at different locations in the workshop using water pipe technique. (Group of 10 students)	**02**
6	III	Prepare a plain smooth block (cuboid) of timber of given dimension using sawing and planning operations. (Individual)	**08**
7	III	Join two wooden blocks with the help of dovetail joint. (Using sawing and chiseling operations) (Individual)	**06**
8	III	Drill the hole of given dimension at given location on a metal/wood piece. (Individual)	**02**
9	III	Observe demonstration of Arc welding and Gas Cutting of metal plates. (Group of 20 Students)	**02**
10	IV	Assemble a pipe line as per given drawing using pipes of one inch diameter, pipes of half inch diameter, nipple, reducer, union, T, elbow, tap etc. (This may involve basic tasks such as marking, cutting, threading, etc and use of appropriate techniques so that water leakage does not occur) and then dissemble this pipe line. (Group of 10 students)	**08**
		Total	**56**

Note: The teacher will have to facilitate, check and assess the progress of the student in above activities; and collect the progress book at the end of the semester. The students are required to

- Write and maintain a progress work book.
- Write Technical Aspects and Safety Precautions involved in the job
- Study and Make drawing of the job to be practiced
- Write a report/ Make a model / Prepare a Demonstration of the given job for practice

7. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the list of proposed student activities like:

- Visit Construction site of different types such as simple residential buildings, malls, multistory buildings etc. and observe the course/topic based practices on the field
- Teacher guided self-learning activities
- Course/ library /internet based mini-projects etc.

These could be individual or group-based.

8. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr. No.	Author	Title of Books	Publication
1	Bull, J.W.	The Practical design of Structural Elements in Timber	Gower Press, 1989
2	Howard C. Massey	Basic Plumbing With Illustrations Revised Edition	Craftsman Book Co;
3	E.Keith Blan KenBanker	Modern Plumbing	
4	B.S. Raghuwanshi	Workshop Technology-	Dhanpat Rai and sons, New Delhi
5	PWD	PWD- Standard Data Book for Building Work	
6	CPWD	CPWD work manual	CPWD, new Delhi

B. List of Major Equipment/ Instrument

- Workbench, Vice, Saw, Plane, Chisel, Level, Tri-square with spirit level
- String, Level / Water tube, Plumb bob, Right Angle
- Welding machine
- Plumbing materials such as pipes and accessories
- Formwork and centering
- Raw material such as bricks, cement, sand, metal, timber, mild steel pieces, electrodes, etc.

C. Civil engineering related websites and software

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. K Venkateshwarulu** , HAMD, Tolani Polytechnic, Adipur,
- **Prof. Vikram M. Patel**, I/C HC, R. C. Technical Institute, Ahmedabad
- **Prof. Arti Pamnani**. Lecturer, BBIT, Vallabh Vidhyanagar.
- **Prof. Bhavesh Modi**, Principal, BVPIT (DS), Umrakh.
- **Prof.**(**Mrs.) Rina Chokshi**, Lecturer, PIET (DS), Limda, Vadodara

Co-ordinator and Faculty Member from NITTTR Bhopal

- **Dr. J.P.Tegar**, Professor Dept of Civil and Environmental Engg,