

SCHOOL OF ENGINEERING

SWARNIM STARTUP & INNOVATION UNIVERSITY

Course	Diploma Engineering (60 Seats)
Duration	3 Years
Aim	To be a knowledge nerve center in civil engineering education, research, entrepreneurship and industry outreach services for creating sustainable infrastructure and enhancing quality of life.
Objective	Apply principles of basic and engineering sciences in analysis, design and operation of civil engineering systems. Assess societal needs and plan suitable infrastructure.
Course Outcome	At the end of the program, the student will be able to, <ul style="list-style-type: none">• Engineering knowledge: knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.• Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems.• Modern tool usage: Create, select, and appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.• Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF Civil Engineering

Basics of Civil Engineering

CODE: 22000008

DIPLOMA 1st Year

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
3	0	2	5		30	50	70	-	150

Objectives: - To have knowledge of basic of civil engineering.

Prerequisites: - Knowledge of Science and mathematics up to 10th level.

Course outline: -After learning the course the students shall be able to:

1. Carry out simple land survey to prepare maps with existing details.
2. Find out area of irregular shaped plane figures.
3. Understand building plan elevation and section.
4. Get acquainted with construction materials.
5. Get acquainted with hydrological cycle and hydraulic structures.
6. Get acquainted with mass transportation systems.

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
<p>Unit –1 CIVIL ENGG. SURVEYING</p>	<p>1a. Use surveying tools and equipments for field survey, leveling and measurements. 1b. Calculate different levels and angles. 1c. Understand given contour map.</p> <p>1.1 Surveying & leveling (its importance and types) 1.2 Necessity for leveling 1.3 Principals of surveying 1.4 Instrument/ tools used for survey and level 1.5 Various methods of finding the field survey measurements 1.6 Chain and Compass Survey 1.7 Preparations of contour sheets/ plan using survey data. 1.8 Procedure of leveling</p>	8	25%
<p>Unit – 2 CIVIL ENGG. DRAWING</p>	<p>2a. Read and Interpret the building drawing. 2b. Plan lay out of a simple building.</p> <p>2.1 Types of building drawings 2.2 Abbreviation, conventions & symbols in civil drawing 2.3 Building byelaws for planning of residential building and industrial building 2.4 Planning of simple residential and industrial building</p>	10	25%
<p>UNIT –3 CONSTRUCTION MATERIALS</p>	<p>3a. Select different types of construction materials as per requirements 3b. Test given construction materials for quality control 3c. Prepare approximate cost estimates.</p> <p>3.1 Common construction materials such as cement, Brick, Stone, Timber, Steel and Concrete. 3.2 Properties of each materials & their acceptable standards 3.3 Quality parameters of materials 3.4 Estimations and costing for simple structure (only the material cost)</p>	9	25%
<p>Unit –4 MACHINE FOUNDATIONS</p>	<p>4a. Assess the typical requirements of foundations for medium sized electrical and Mechanical Machines.</p> <p>4.1Criteria for machine foundation 4.2Provisions for foundation design considerations in machine foundations. 4.3Factors to be considered while designing machine foundations such as type of soil 4.4Design foundations for simple machine like lathe, compression press, universal testing machine , electric power hammer etc. BIS CODE of practice for machine foundations I.S.- 2974 - Part –I& II</p>	9	25%

Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics

Books Recommended:

1. Title: Surveying Vol. I Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain 16th Edition Publisher: Laxmi Publication Delhi
2. Title: Surveying Theory and Practice (7th Edition) Author: James M Anderson and Edward M Mikhail Publisher: McGraw Hill Education, India Pvt. Ltd.
3. Title: Surveying and Leveling Author: R. Subramanian Publisher: Oxford University
4. Title: Surveying and Leveling Author: N. N. Basak Publisher: Tata McGraw Hill Education, Pvt. Ltd. New Delhi
5. Title: Surveying Vol. I Author: S. K. Duggal Publisher: Tata McGraw Hill Publication New Delhi
6. Title: Elements of Civil Engineering Author: Dr. R.K. Jain and Dr. P.P. Lodha Publisher: McGraw Hill Education, India Pvt. Ltd.
7. Title: Building drawing Author: M.G.Shah, C.M.Kale and S.Y.Patki Publisher: Tata McGraw Hill
8. Title: Civil Engg. Drawing Author: S. C. Rangwala Publisher: Charotar Pub. House Anand
9. Title: Building Construction Author: Dr. B. C. Punmia, Ashokkumar Jain, Arunkumar Jain Publisher: Laxmi Pub. Delhi
10. Title: Building Construction and Construction Material Author: G.S.Birdie and T.D. Ahuja Publisher: Dhanpat Rai Publishing Company

E-Resources:

<http://nptel.ac.in/course.php?disciplineId=105>

Practical List:-

Sr. No.	Practical
1	Chain survey
2	Compass survey
3	Leveling

Project:

Based on practical students shall perform following projects.

1. Chain and compass survey project
2. Profile leveling and contouring

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF Civil Engineering

Civil Engineering Workshop

CODE:

Diploma Engineering 1st Year

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
0	0	6	6	6	-	100	-	-	100

Objectives: -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 possess. He/she should be able to supervise construction activities like brick masonry, woodwork, concreting, welding, finishing etc. including quality control and maintenance 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.

Prerequisites: -Knowledge of science and mathematics up to 10th level.

Course outline: -After learning the course the students shall be able to:

- 1) Able to identify the civil engineering objects.
- 2) Able to select right tool for right process.
- 3) Able to identify the civil work.

Content:

Unit	Topics	Teaching Hrs.	Module Weightage
Unit – I Civil Engineering Activities At Construction Site	Develop basic technical know-how of construction activities. 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	06	20%
Unit– II Masonry and Concreting	Apply basic techniques for masonry and concreting works. 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	06	20%
Unit– III Carpentry, Welding and Drilling work	Identify appropriate materials required for each activity. Select appropriate tools and equipment 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 equipment and its use in	06	20%
Unit– IV Plumbing	Install the plumbing and fixtures in buildings Observe the technical aspects involved in workmanship of various plumbing tasks 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.	06	20%
Unit– V Finishing Works	Provide and fix the false ceiling, aluminum –glass works. 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.	06	20%

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.

Teaching & Learning Methodology: - Field Learning and Teaching

Books Recommended:

Bull, J.W. The Practical design of Structural Elements in Timber Gower Press, 1989

Howard C. Massey Basic Plumbing With Illustrations Revised Edition Craftsman Book Co;

CPWD CPWD work manual CPWD, new Delhi

E-Resources:

<http://nptel.ac.in/course.php?disciplineId=105>

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

SWARNIM STARTUP & INNOVATION UNIVERSITY

SCHOOL OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF Civil Engineering

Building Drawing

CODE: 22000014

DIPLOMA 1st Year

Teaching & Evaluation Scheme:-

Teaching Scheme				Credits	Evaluation Scheme				
Th	Tu	P	Total		Internal		External		Total
					Th	Pr	Th	Pr	
2	0	4	6		30	100	70	-	200

Objectives: -Drawing is very important subject especially for civil engineers. This is also considered as a language of engineering communication. Basic and primary features of Engineering Drawing are being taught in Basic Engineering Drawing. At advance stage the skills of producing working drawings are necessary for technicians, this course has been designed in such a way that a technician can produce more detailed Civil Engineering Drawing related to construction of single storied , double storied residential buildings, public buildings and other simple civil engineering structures. Moreover, application of building regulation and by-laws as per local authorities will also be taught in this course, knowledge of which is must for planning buildings so that plan is approved by local civic authorities.

Prerequisites: -Knowledge of Science and mathematics up to 10th level.

Course outline: -The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competencies: i. Read and interpret the building construction drawings.

ii. Produce residential building drawing and other construction details with Building services considering building control regulations and by-laws

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
<p>Unit –1 Introduction</p>	<p>1a.Appreciate types of Drawings and its importance. 1b.Draw various types of Projections 1c.Use building drawing Symbols, Conventions and Abbreviations 1d.Apply various types of scales as per needs.</p> <p>1.1 Types of drawing with appropriate scale & uses index map, key plan, village map, site plan, and layout plan. 1.2 Types of Projection adopted in Building Drawing 1.3 Scales for various types of Drawings 1.4 Working drawing, large scale drawing enlarges scale drawing. 1.5 Symbols, Conventions and Abbreviations for - Electrical fittings , water supply ,sanitary fittings, material for construction etc. 1.6 Sizes of various standard papers</p>	10	18%
<p>Unit-2 Building, regulation, byelaws and Principal of Planning</p>	<p>2a. Apply the Bye laws and Principles of Planning for residential and other public buildings.</p> <p>2.1 building bye laws of local body for residential building (show local authority publication) -plot area, built up area, carpet area, FSI, size of rooms, margins, heights, passages, ventilation, circulation and others 2.2 principles of planning for residential building in detail such as - Room dimension, area, heights, privacy, roominess factor ,orientation, grouping, drainage, aspect, prospect, drainage, economy 2.3 Color code for alteration and addition in existing building 2.4 Approval procedure with respect to bye laws</p>	10	20%
<p>UNIT-3 Planning of Residential Building</p>	<p>3a. Develop concept plan of buildings 3b.Prepare detail drawings for single and two storied residential building and public building</p> <p>3.1Concept plan and drawing of residential single and two storied buildings 3.2Concept plan of public buildings such as hospital ,school, shopping center , office building and industrial unit 3.3 Given situation & Plot area, preparation of detailed drawing of a single storied and double storied residential building with detail of Line plan, Detailed Plan, Ground floor Plan, First floor plan, Elevation and Sections</p>	12	22%
<p>Unit-4 Perspective Drawings and modeling</p>	<p>4a. Generate perspective view of simple building by different methods 4b. Develop building models</p> <p>4.1 Introduction of perspective view and other related terms. 4.2 Perspective view of single room residential building and simple public buildings 4.3 Elements of perspective drawing. 4.4 Model preparation of simple buildings</p>	12	20%

Unit- 5 Construction al details drawing of buildings	5a. Draw details of parts of buildings 5b. provide scope and provisions for building components and services 5.1 Drawings of Parts of buildings such as staircases, chajjas , projections, columns , pier, slabs, footings etc 5.2 provisions in drawings for building services such as air conditioning, plumbing, water supply and firefighting, elevators, lifts and escalators etc 5.3 Electrification plan and drawings: 5.4 Show building service like water supply, sanitary, electrification on line plan	12	20%
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Teaching & Learning Methodology: - Chalk and Talk method mostly preferable and Power point presentation is also preferable for some needful topics

Books Recommended:

1. V. B. Sikka Civil engineering drawing B. D. Kataria Sons , Ludhiana
2. Gurcharansingh, Subashchander Civil Engineering Drawing Standard Publishers Distributors, Delhi
3. R. S. Malek G. S. Meo Civil Engineering Drawing New Asian Delhi
4. B. H. Shukla Civil Engineering Drawing AtulPrakashan Ahmedabad

E-Resources:

<http://nptel.ac.in/course.php?disciplineid=105>

SUGGESTED LIST OF PRACTICAL/EXERCISES

- 1) Interpretation of building drawings approved under local authority.
- 2) Draw symbols, conventions and Abbreviations in sketch book.
- 3) Study of building by-laws act and national building code (NBC)
- 4) Draw detail plan on drawing sheet - 1 plan, elevation and section of existing building (actual Measurement Drawing)
- 5) Draw working drawings sheet -2 for single storied residential building (bungalow) on 250sq.m plot with scale and show following detail: GF & FF plan with elevation, section and opening schedule.
- 6) Prepare concept plan of any one other type of building considering local bye laws: high school building, Shopping centre, Hospital and Industrial Building in sketch book.
- 7) Visit a residential building and observe the existing building service and Draw line plan for above services in sketch book.