

Title of Subject	:	<u>Surveying-I (Th + Pr)</u>
Code	:	CE112
Discipline	:	Civil Engineering (2 nd Semester)
Effective	:	20-Batch and Onwards
Pre-requisite	:	Nil Co-requisite: Nil
Assessment	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination
Credit Hours	:	02 + 01 Marks : 50 + 50
Minimum Contact Hours:	:	30 + 45

Course Learning Outcomes (CLOs):

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	DISCUSS various survey equipment and techniques to be used for linear and angular measurements and for computing the areas of plots.	C2	1
2	PREPARE the L-section and X-section using the computations of levels.	C3	2
3	EXECUTE various surveying instruments used for linear and angular measurements.	P4	5

Course outline:

- **Introduction**
Introduction to Surveying, Classification of surveying.
- **Measurement of Distance**
Various methods of measuring distance, Instruments for measuring distance and marking stations, Ranging out survey lines, Chaining on sloping ground.
- **Chain Surveying**
Introduction to Chain Surveying, Offset and its types, Obstacles in Chain Surveying, Layout by Offset Method.
- **Traverse Survey**
Traverse, types of traverse, Bearing and designation of bearings, Local attraction, magnetic declination, Equipment used for finding Bearings, Computation of Bearings and Angles.
- **Levelling**
Definition, principles, classification of levelling, Types of levels and their temporary and permanent adjustments, Booking and reduction of levels, Profile and cross-section levelling, contouring.
- **Computation of Areas and Volume**
Computation of areas by using mid-ordinate rule, average ordinate rule, trapezoidal and Simpson rule, Computation of areas by co-ordinates, Computation of volume by trapezoidal and end area method.

- **Surveying Drafting**
Plotting Profiles, Cross Sections, Plans and Contours.

Practical Work to be carried out:

1. a). Introduction to Health and Safety measures in Surveying Lab.
b). Introduction to various Surveying Instruments.
2. To range out a survey line when the two ends of a line are inter-visible from each end.
3. To measure the horizontal distance between two terminal stations by different methods. (Pacing, Measuring Tape and Chain).
4. To range out a survey line and mark the intermediate points when two ends of lines are not inter-visible from each end. (Indirect Ranging).
5. To determine the horizontal distance between the two terminal stations on a sloping ground by (i). Stepping Method. (ii). Using Abney Level
6. To set out the base line and Perpendicular lines / Offsets in the field.
7. Layout of rooms of a house by offset method using Pythagoras Theorem.
8. Introduction to Automatic Level and Temporary Adjustment of an Automatic Level.
9. To determine the Staff Readings at different points on the natural ground by Auto Level.
10. To determine the reduced level of an existing Road-Profile Levelling.
11. To collect data for cross sectional levelling of a proposed road using Auto Level.
12. To draw Profile of a Road (L-section) from the obtained level data.
13. To draw Cross sections of a proposed road from obtained level data.
14. To determine area of an irregular boundary by Simpson's Rule.
15. To perform an open-ended lab.

Recommended Books:

- Plane Surveying, Dr A M Chandra, Latest Edition
- Surveying Vol: (I + II), B.C Punmia, Latest Edition
- Surveying Practice, Jerry. A. Nothanson and Philip Kissam, Latest Edition

Approval:

Board of Studies:	Resolution No. 32.3	Dated: 03-10-2020
Board of Faculty:	Resolution No. 20.11	Dated: 07-10-2020
Academic Council:	Resolution No. 98.7(ii)	Dated: 22-10-2020

Title of Subject	:	<u>Civil Engineering Drawing (Th + Pr)</u>
Code	:	CE122
Discipline	:	Civil Engineering (2 nd Semester)
Effective	:	20-Batch and onwards
Pre-requisite	:	Geometrical Drawing Co-requisite: Nil
Assessment	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination
Credit Hours	:	02 + 01 Marks : 50 + 50
Minimum Contact Hours:		30 + 45

Course Learning Outcomes (CLOs):

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	PREPARE plans, elevations and sections of various civil engineering works and related works.	C3	1
2	MAKE drawings of civil engineering works using modern tools.	P4	5

Course outline:

- **Introduction**

Need and requirement of drawings for civil engineering works, General nature of drawings, Components, symbols and nomenclature needed for specific drawings such as architectural, plumbing, electrical, roads and earthwork, Drawing at various stages of works.

- **Architectural Drawing**

Elements of architectural planning and design, Schematic and working drawings and details of residential, commercial, religious, recreational, industrial, clinical, hospital and educational buildings, Working drawings of Foundation, Beam and Column, Details of doors, windows and staircases.

Practical work to be carried out:

1. To know about different tools used in Civil Engineering Drawing and introduction of HSE measures.
2. To draw plan, elevation and section of one room.
3. To draw plan, elevation and section of two room with verandah.
4. To draw the plan, elevation and cross section of Beam and column.
5. To draw the plan and elevation of different types of stairs.
6. Introduction to AutoCAD software and to know about UNITS and DIMENSIONS in Auto CAD.
7. To know the procedure and usage of different commands of DRAW, PROPERTIES, INQUIRY and DIMENSION toll bar.
8. To know the procedure and usage of different commands of MODIFY and LAYER toll bar.
9. To draw irregular closed figure and calculate its area and perimeter in AutoCAD.
10. To draw the architect plan, elevation and cross section of single room and double room with verandah in AutoCAD.
11. To draw the architect plan and layout of bungalow in AutoCAD.
12. To draw the plan, elevation and cross section of isolated column with footing and plinth beam in AutoCAD.
13. To draw the plan of half turn staircase in AutoCAD.

14. To draw the plumbing plan of house in Auto CAD.
15. To Perform an open-ended lab.

Recommended Books:

- Civil Engineering Drawing, M. Chakraborti, Malik Book Depot, Lahore, Latest Edition
- Civil Engineering Drawing, Gurcharan Singh, Malik Book Depot, Lahore, Latest Edition
- Introduction to AutoCAD® 2016 2D and 3D Design, Berned S Palm and Alf Yarwood, AutoDesk, Latest Edition

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Title of Subject	:	<u>Engineering Geology (Th + Pr)</u>	
Code	:	CE125	
Discipline	:	Civil Engineering (2 nd Semester)	
Effective	:	20-Batch and onwards	
Pre-requisite	:	Civil Engineering Materials	Co-requisite: Nil
Assessment	:	Theory: 20% Sessional, 80% Written Semester Examination (20% Mid, 60% Final) Practical: 40% Sessional, 60% Final Semester Examination	
Credit Hours	:	03 + 01	Marks: 100 + 50
Minimum Contact Hours:		45 + 45	

Course Learning Outcomes (CLOs):

Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	IDENTIFY the minerals, rocks, and their physical properties.	C1	1
2	DISCUSS structural geology, geo-hazards, hydrogeology, tunnelling and site for the important Civil Engineering projects.	C2	1
3	MAKE drawing of cross sections and landslide models and recognize the physical and chemical properties of rocks and minerals; and folds and faults in rocks.	P4	4

Course outline:

- **Introduction**

Introduction to Geology and Engineering Geology, Engineering Geology versus Geology, Importance of Engineering Geology for Civil Engineering Projects, Geological Science and Subdivisions: Earth's Materials, Earth's Process, Earth's History, Structure and Composition of the Earth, Geological Times, Sequence and Principles of Stratigraphy.

- **Minerals and Rocks**

Introduction to Minerals and Rocks, Identification of Minerals, Crystal Form of Minerals, Rocks: Igneous, Sedimentary and Metamorphic, Rock Cycle, Rock-Forming Minerals, Physical Properties of Rocks and Minerals and Their Determination, Classification of Rocks and Minerals with Respect to Color, Hardness, Grain Size, Texture, Strength and Weathering, Identification of Common Rock Types and Their Engineering Properties: Shales, Sandstones and Limestone.

- **Structural Geology**

Introduction to Structural Geology, Dip and Strike, Folds and Their Types, Faults and their Causes, Classification of Faults with Respect to Relative Moment, Dip and Strike of Strata, Amount of Inclination, Mode of Occurrence, Joints and Their Classification, Field Interpretation of Folds Faults and Joints, Structures due to Denudation.

- **Earthquakes**

Tectonics Plates, Earthquakes and Their Causes, Measurements of Earthquakes, Protective Measures against Earthquakes, Earthquake Zoning of Pakistan.

- **Earthflows and Land Sliding**

Introduction to Earthflows and Land Sliding, Types of Earthflows: Soil Creep, Rock Creep, Solifluction and Mudflows, Causes of Earthflows, Types of Land Sliding: Slump, Rockslides and Rock Falls, Causes of Land Slides.

- **Hydrogeology:**
Introduction to Wells, Springs, Streams, Ground Water, and Glaciers, Types of Wells, Springs, Streams, Ground Water, and Glaciers.
- **Tunnelling**
Introduction to Tunnels, Types of Tunnels, Tunnel Construction Methods in Rocks, Geological Survey Prior to Tunnelling, Lining of Tunnels and Its Sections.
- **Selection of Sites for Civil Engineering Projects**
Role of Geology in Selection of Sites for Dams, Reservoirs, Tunnels and Other Civil Engineering Projects, Such as Highways, Airfields and Bridges, Brief Introduction of Local Geology.

Practical work to be carried out:

1. Introduction to the Engineering Geology Laboratory and HSE (Health, Safety and Environment) measures
2. To determine the hardness of minerals using Moh's scale.
3. To determine the streak of minerals.
4. To determine the compressive strength of rocks using Schmitt hammer.
5. To determine the unconfined compressive strength of rocks in UTM machine.
6. To determine the tensile strength of rocks in UTM machine.
7. To determine the slake durability index (Weathering) of rocks.
8. To determine the presence of carbonates in rocks using acid test.
9. To observe the folds using sand box.
10. To observe the different types of faults using sand box.
11. To distinguish the folds and faults in rocks at site
12. To prepare the rainfall-induced landslide in landslide Physical Model.
13. To prepare the relationship between rainfall intensity and erosion using landslide physical model.
14. To prepare drawing of Cross Sections from Geological maps.
15. To perform an open-ended lab.

Recommended Books:

- A Geology for Engineers, Blyth, F.G.H, Arnold International, Latest Edition
- Geology and Engineering, Legget, R.F, McGraw Hill International, Latest Edition
- Goodman, R.E: Engineering Geology: Rock in Engineering Construction, John Wiley & Sons, Inc., Singapore, Latest Edition

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