

Course Code : AEN 403

Course Title : Farm Structures and Surveying

Credit Hours : 3(2+1) Full Marks: 75 Theory: 50 Practical: 25

OBJECTIVES

Upon the completion of this course, the students will be able to know to prepare and interpret maps/plan and learn about farmstead planning and best construction practices of farm structures.

SYLLABUS

Definitions, classification, units of measurements, scale, conventional signs; chain survey; taping; instruments, taping on level and sloping ground, error, chain/tape triangulation; survey stations and lines, offset, obstacles in chaining; compass survey, types, meridians, angles and direction, bearing, interior angles, prismatic compass, traversing, magnetic declination; leveling: methods, instruments, temporary adjustment, booking and reducing levels, classification, contour, topographic map, land leveling and grading. Construction materials; components of farm structure: foundation shallow and deep, size, walls, floors, roofs, doors, and windows; dampness prevention, plastering, pointing, skirting, RCC, PCC, scaffolding, centering and shuttering; site selection and planning of farmstead; insulation and ventilation in farm buildings; planning and functional requirements of dairy cattle house, poultry house, swine house, design of feed, fodder and grain storage structure and Functional requirements and constructional details of Green House and Poly-House; estimating and costing of farm structures, quantity estimate and rate analysis.

II. Course Breakdown

A. Lecture

S. N.	Topic	No. of Lectures
1.	Introduction: Definition of surveying, classification, units of measurement, scale (graphical and shrunk scale), conventional signs	2
2.	Chain survey: methods of linear measurement (pacing, mileage, recorder, taping), types of chains and tapes, ranging (direct and indirect), chaining on sloping ground, chain triangulation, survey lines, offset, obstacles in chaining, and plotting	4
3.	Compass survey: introduction, meridians, angles and directions, bearing, interior angles, types of compass, use of prismatic compass, traversing, local attraction, and plotting traverse.	3
4.	Definition, objective, principle, Leveling instruments, Temporary adjustment, Methods of leveling; Booking and reducing levels (Height of Instrument and Rise Fall Method)	3
5.	Contour (Introduction, characteristics), Topographic map and its uses	1

6.	Construction materials used in the construction of agricultural structures; bricks, cement, sand, gravel, timber, steel, CGI sheet, thatch, concrete, and Mortar, RCC, PCC, centering and shuttering	3
7.	Components of farm buildings: Foundation, walls, floors, roof, openings (door & windows), beam and column	2
8.	Selection and Planning of Farmstead and thermal insulation and ventilation process and principle in farm buildings.	2
9.	Planning, layout and functional requirements of: Dairy cattle house; Poultry house; Swine house.	4
10.	Sizing and Structural Details of Grain storage; Feed and fodder storage structure: Bag and Bulk Storage Structures, Silo, trench, pit and tower silo; Functional requirements and constructional details of Green-House and Poly-House	3
11.	Cost estimation: a. Types and estimate (Approximate and detailed) b. Procedure of preparing detail estimate of agricultural structures. c. Analysis of rate.	3
Total		30

B. Practical

S. N.	Topic	No. of Practicals
1.	Concept of drawings, orthographic projections	1
2.	Planning and layout of dairy cattle, poultry and swine housing	2
3.	Planning and layout of Feed and fodder storage structure and Green House and Poly-House	2
3.	Preparation of detailed quantity and cost estimate of a farm building	2
4.	Working out quantities of materials	1
5.	Working out areas based on: 1) Direct measurement on ground and 2) Drawing measurement applying graphical and instrumental method	2
6.	Chain surveying	1
7.	Surveying of a given plot of land and preparing map at suitable scale	1
8.	Leveling: Instrument handling; profile leveling/longitudinal sectioning	2
9.	Contour map; concept of drawings, orthographic projections	1
Total		15

REFERENCES

C.Punmia, Ashok. Kr. Jain and Arun Kr. Jain. 2005. Higher Surveying. 15th Ed. Laxmi Publications.

S. Kumar. 2008. Building Construction. Standard Publishers and Distributors.

Nepal National Building Code 201, 202, 203, Department of Buildings, Government of Nepal, Kathmandu.

Farm Buildings in Punjab by A.P. Bhatnagar. Punjab Agricultural University Publication
Farm Building Design by Neubaur L. W. Prentice-Hall Ltd. India