

Agriculture And Forestry University  
**Service Commission**  
Rampur, Chitwan

**Subject: Civil Engineering**

Level: Section Officer, Third class

**COURSE CONTENT**

**1. Building materials and construction**

- 1.1 Properties of building materials
- 1.2 Stone masonry
- 1.3 Brick masonry
- 1.4 Hollow concrete blocks
- 1.5 Sand: requirements of good quality sand, sieve analysis, fineness modulus
- 1.6 Cementing materials: types and properties of lime and cement, cement mortar tests
- 1.7 Ceramic materials
- 1.8 Metals- steel types and properties, alloys
- 1.9 Timber and wood: types and properties
- 1.10 Miscellaneous materials: Asphaltic materials, paints

**2. Structure analysis and design**

- 2.1 Stress and strains
- 2.2 Analysis of beams and frames
- 2.3 Reinforced concrete structure: working stress and limit state method  
(Beams, Columns, Slabs and footings), introduction to pre-stressed concrete.
- 2.4 Steel and timber structure
- 2.5 Design principles on timber beams and columns

**3. Concrete technology**

- 3.1 Constituents and properties of concrete
- 3.2 Water cement ratio
- 3.3 Grade and strength of concrete
- 3.4 Admixtures
- 3.5 High strength concrete
- 3.6 Pre-stressed concrete technology

## **4. Construction management**

- 4.1 Construction scheduling and planning
- 4.2 Contractual procedure and management
- 4.3 Material management
- 4.4 Cost control and quality control
- 4.5 Project maintenance
- 4.6 Occupational health and safety
- 4.7 Project monitoring and evaluation
- 4.8 Quality assurance plan

## **5. Estimating and costing**

- 5.1 Methods of calculating quantities
- 5.2 Types of estimates
- 5.3 Key components of estimating norms and rate analysis
- 5.4 Preparation of bill of quantities
- 5.5 Purpose, types and importance of specification
- 5.6 Methods of valuation

## **6. Drawing techniques**

- 6.1 Types of drawings, suitable scales
- 6.2 Drafting tools and equipments
- 6.3 Theory of projection drawing
- 6.4 Topographic, electrical, plumbing and structural drawings
- 6.5 Techniques of free hand drawing

## **7. Engineering survey**

- 7.1 Basic principles
- 7.2 Linear measurement techniques
- 7.3 Compass and plane table surveying
- 7.4 Leveling and counteracting
- 7.5 Theodolite traversing
- 7.6 Uses of total stations and electronic distance measurement

## **8. Professional practices and code of conduct**

- 8.1 Ethics and professionalisms in engineering practices
- 8.2 Nepal Engineering Council Act 2055 and regulations 2056
- 8.3 Relation with clients, contractor and fellow professionals
- 8.4 Public procurement practices for works, goods and services.

**The END**