

## **PART-I (Mensuration)**

1. Definition, objectives, scope and importance of Mensuration in Forestry.
2. Principles, methods and instruments for measurements of diameter and height of trees; Errors of measurements and variations.
3. Principles and uses of Relaskope in forest mensuration; Basal area factors and its uses.
4. Forms and shapes of trees; taper functions and taper equations.
5. Measurement of logs and tree volume; Stack volume estimation, different formulae for calculating volume of logs; Construction and testing of volume table, types of volume tables.
6. Stand variables and measurements of basal area-canopy cover and dominant height; stock measurement.
7. Stem analysis; estimation of age and growth rate of trees in plantations.

## **PART-II (Inventory)**

1. Revision of statistical procedures in sampling and objectives of inventory.
2. Types of forest inventory. Inventory Planning.
3. Sampling designs commonly applied in forest inventories-random, systematic, cluster, two phase, multistage and stratified sampling designs; relative efficiency of sampling designs; subjective and objective sampling designs; Principles and application of point sampling.
4. Choice of plot size and shape, permanent sample plots. Application of remote sensing technique in forest inventory; Forest inventory planning and procedure; Collection of data from field processing and report writing.
5. Estimation of growth and yield, yield table, uses of yield table, MAI and CAI, dominant height, Rotation age fixation, site assessment in plantations for forecasting growth and yield.

**SIXTH SEMESTER**

**Course No. : FOR 321**

**Course title : SOCIAL FORESTRY**

**Marks : Theory: 50 (2 cr.); Class Test: 25 (1 cr.: Written-20, Attendance-05); Total = 75 (3 cr.)**

**Theory**

1. **Introduction:** Concept and principles of social forestry; Analysis of social forestry programme in Bangladesh and lessons learned from social forestry projects; Social forestry as resources system.
2. **Emergence:** The ages of Indian forestry - colonialism, commercialism, conservation, collaboration and emergence of social forestry.
3. **Rural development:** Social forestry as a vehicle for rural development; benefits from social forestry;
4. **Social forestry elements:** Physical and socio-economic environment of social forestry; Targets, goals, and objectives of social forestry; Production systems and appropriate technologies for social forestry;
5. **Institutional development:** Delivery system and institutional development of social forestry; social forestry extension and education; Social and environmental aspects/impacts of social forestry.
6. **Monitoring and evaluation:** Planning, designing, participatory monitoring and evaluation of social forestry; People's participation, land and tree tenure system, efficiency, equity and sustainability.
7. **Gender issues:** Role of gender in social forestry; Strategies to incorporating women in social forestry development.
8. **Tools and techniques:** Tools and techniques of rural appraisal through Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA), Participatory Action Research (PAR), Diagnosis and Design (D&D), Social Impact Assessment (SIA) and Gender Analysis (GA).



**Course No. : FOR 313**

**Course title : WOOD STRUCTURE AND PROPERTIES**

**Marks : Theory: 50 (2 cr.); Class Test: 25 (1 cr. : Written-20, Attendance-05); Practical: 25 (1 cr.); Total =100 (4 cr.)**

### **Theory:**

1. **Wood anatomy:** Source of wood; Woody plants and their parts; Formation of wood, types of plant cell in wood formation, cross sectional view of different parts of log, different kinds of wood
2. **Gross features:** Growth rings, colour, lusture, odour, taste, grain, texture, figure etc. in wood and their effects on wood utilization.
3. **Physical properties:** Weight, Density, specific gravity, permeability of wood to water and other liquids, porosity
4. **Minute structure of softwood and hardwood:** Conducting tissues, strengthening tissues, storage tissues, inclusion resin canals, tyloses and other features etc.
5. **Elastic properties of wood:** Stress, strain and Hook's law, elastic limit; modulus of elasticity, modulus of rigidity.
6. **Strength properties of Wood:** Flexibility, stiffness, toughness, brittleness, hardness, modulus of rupture, maximum load, measurement of strength properties - compression, tension, shear, bending. Static and impact bending tests, factors affecting strength properties of wood and utilization.
7. **Wood and moisture relations:** Forms of water, MC, MMC, movement of water in wood, EMC, FSP, shrinkage and swelling.
8. **Chemical properties of wood:** Major chemical constituents of cell wall - cellulose, hemicellulose, lignin, extractives- inorganic and organic etc. and their influence on wood properties.
9. **Ultra structure of wood:** Mycells, microfibrils, cell-wall layers and its chemical composition, pits, perforations etc.
10. **Defects in wood :** Natural defects - Reaction wood, blemish wood,
11. **Thermal and electrical properties of wood**
12. **Wood properties:** Properties of wood of major timber species of Bangladesh



**Course title : AERIAL PHOTOGRAMMETRY, REMOTE SENSING AND GIS**

**Marks : Theory: 50 (2 cr.); Class Test: 25 (1 cr.: Written-20, Attendance-05); Practical: 25 (1 cr.) ; Total = 100 (4 cr.)**

### **Theory:**

1. **Introduction:** Scope, importance, historical development of remote sensing
2. **Electromagnetic energy:** Nature, propagation of electromagnetic radiation, interaction of EMR with atmosphere (scattering, reflection, absorption, atmospheric, windows, irradiance, exitance) and matter, spectral properties and reflectance characteristics of earth surface features: Vegetation, soil and water: Spectral signature: Red edge, vegetation indices
3. **Aerial photography:** Cameras, films and filters used in aerial photography; Planning, taking and handling of aerial photographs; Determination scale of aerial photographs, supervised and unsupervised data, ground truthing.
4. **Photo mosaics:** Controlled and uncontrolled mosaics, mapping from remote sensing data with emphasis on triangulation method.
5. **Photo interpretation:** Principles and elements of image recognition; Topographical study, drainage assessment and road planning from aerial photographs.
6. **Satellite imagery:** Types of imagery, satellite technology and imagery production; Digital and manual image analysis, multi-concept of remote sensing and MSS data.
7. **Major remote sensing systems and sensor technology:** Spaceborne systems (Landsat, IRS, SPOT, ENVISAT, Terra and Aqua etc.) and their sensor characteristics, airborne sensors, types, platforms.
8. **Introduction to GIS:** Concepts, scopes and components of GIS; Map data representation.
9. **Geographic database:** Concepts, data input, verification and storage.
10. **Spatial data analysis:** Acquisition of data from different resources, analytical tools and analysis; Digital terrain model and satellite data processing, spatial data set management using GIS; GPS technique.