B.Sc(Hons) Forestry

India is a land of forests and agriculture and for many decades country’s major occupation lacked specialized and modern techniques. This necessity originates the need of the innovative attitude. The various courses in Forestry are designed to help student understand the modules of forestry, the environment etc. Moreover the course is designed in such a way that the student would also get knowledge about the management, conservation and expansion of the forests as it is the need of the hour not only from resource point of view but also from the point of view of environment. The objective of the program is to educate future forest and environment students who have general knowledge and skills in forests management and environment protection process. After the completion of the course the students would be able to plan, manage and develop forest resources for multiple benefits according to ecological and socio-economic demands

Eligibility Criteria: 10+2 in Science or equivalent in any stream

To earn a B.Sc (Forestry), a student has to earn a minimum of 120 credits. Min 60 credits to be earned from general science subjects, Min 30 credits from Forestry subjects and remaining can be taken from any stream

Every student has to attain a minimum of D grade in all courses; a student may however, and repeat or change any course being offered. Notwithstanding, every student must acquire the desired number of credits. The detailed course structure under different categories is given in succeeding pages. Brief description of the course content follows thereafter.
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13.101 PRINCIPLES AND PRACTICES OF SILVICULTURE
Credit 4


13.102 FOREST ECOLOGY, BIODIVERSITY & CONSERVATION
Credit 4

Content: Historical development of ecology as a science. Concept of levels of biological organization. Ecosystem – classification and distribution. Forest environment - Major abiotic and biotic components and their interaction, Nutrient cycling, trophic levels, food webs, ecological pyramids and energy flow. Population ecology - definition, population dynamics and carrying capacity, preparation of life table and its importance in forest management. Community ecology – Species interaction, Ecological succession, terminology, basic concepts, climax vegetation types, Methods to study effects of forest management on succession. Island Biogeography. Autecology of important tree species. Biodiversity and conservation – definition, levels of study, distribution of diversity in life forms, hotspots of biodiversity, measurement of diversity and diversity indices. Principles of conservation biology.

13.105 CYTOLOGY AND GENETICS
Credit 4


13.104 GENERAL BIOCHEMISTRY
Credit 4

Content: Carbohydrates-occurrence and classification-structures of glucose, fructose, ribose, maltose, lactose, starch and cellulose, physical and chemical properties of
carbohydrates isomerism, optical activity, reducing property, reaction with acids and alkalis-osazone formation. Lipids classification-important fatty acids and triglycerides, essential fatty acids - rancidity of oils acids value, saponification value & iodine value – phospholipidstypes and importance-plant pigments-structure and function of chlorophyll and carotenoids-sterols-basic structure. Protein - classification - functional and solubility - amino acids-classification and structure essential amino acids - properties of amino acids colour reactions, amphoteric nature and isomerism-structure of proteins – primary, secondary, tertiary and quaternary properties and reactions of proteins.

13.105 INTRODUCTION TO TREE SCIENCE
Credit 4

13.106 COMPUTER APPLICATIONS
Credit 4
Content: Computer application: Introduction to computers and personal computers, basic concepts, operating system, DOS and Windows, introduction to programming languages, BASIC language, concepts, basic and programming techniques, MS Office, Win Word, Excel, Power Point, introduction to Multi-Media and its application. Visual Basic-concepts, basic and programming techniques, introduction to Internet. Information management, such as data storage/retrieval, data validation, security of data, data manipulation, presentation of data and report generation – Introduction to commonly used software application packages – Familiarization with commonly used application packages like RDBMS, MS-Office, Word Processing etc.

13.107 FOREST MENSURATION
Credit 4
13.108 ENVIRONMENTAL STUDIES – I
Credit 4
Content: The multidisciplinary nature of environmental studies: Definition, scope and importance- Need for public awareness- Ecosystems-Concept of an ecosystem-?Structure and function of an ecosystem-Producer, consumers and decomposers-Energy flow in the ecosystem- Ecological succession-Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the various ecosystems.

13.109 INTRODUCTION TO FOREST SOIL SCIENCE & GEOLOGY
Credit 4

13.110 DENDROLOGY
Credit 4

13.111 PRINCIPLES OF FOREST ECONOMICS
Credit 4
Content: Nature and scope of forest economics, importance of forestry in economic development. Concepts of demand, derived demand and supply with special reference

13.201 SURVEYING AND LEVELING
Credit 4

13.202 TREE SEED TECHNOLOGY
Credit 4
Content: Introduction – Seed and its importance – afforestation activity and seed requirements in India and UP. Role of seed technology in nursery stock production. Production of quality seed, identification of seed collection areas-seed orchards – Location and maintenance of seed orchards-isolation and roguing, seed source, provenance and stands. Selection of seed tree, genotypic and phenotypic selection, plus tree – pure stands, elite seed tree, isolated tree and their location. Locality factors. Seed Collection – Planning and Organization, Collection methods, Factors affecting seed collection, Seed maturity and tests. Seed processing – Seed extraction, drying, blending, cleaning, grading, treating, bagging, labeling and storage. Storage – orthodox and recalcitrant seeds, precautions of handling of recalcitrant seeds, natural longevity of tree seeds, factors affecting longevity – storage conditions, methods and containers.

13.203 AGROMeteorology
Credit 4

13.204 FUNDAMENTALS OF EXTENSION EDUCATION & COMMUNITY DEVELOPMENT
Credit 4
Content: Extension Education : Extension education: meaning, definition, nature, scope, objectives, principles, approaches and history. Forestry extension: process, principles and
selected programmes of leading national and international forest institutes. People’s participation in forestry programmes. Motivation of women community, children, youth and voluntary organizations for forestry extension work. Rural Development: meaning, definition, objectives and genesis. Transfer of technology programmes like lab to land programme (LLP) national demonstration (ND), front line demonstration (FLD) Krishi Vigyan Kendras (KVK), Technology Assessment and Refinement Programme (TARP) etc. of ICAR. Communication: meaning, definition, elements and selected models. Audio – visual aids: importance, classification and selection. Programming planning process – meaning, scope, principles and steps. Evaluation: meaning, importance and methods. Scope and importance of Participatory Rural Appraisal (PRA) & Rapid Rural Appraisal (RRA).

13.205 FOREST MANAGEMENT AND WORKING PLAN
Credit 4

13.206 SILVICULTURAL SYSTEMS
Credit 4

13.207 FOREST ENTOMOLOGY AND PEST MANAGEMENT
Credit 4
Content: Definition, importance and scope of Entomology. Definition of insect and its position in the Animal Kingdom. Important characters of phylum arthropoda and class
insecta. External morphology of generalized insect. Insect growth and development, Reproduction in insects, immature stages (Egg, Larvae/Nymph and Pupae); metamorphosis in Insects Taxonomic classification of class Insecta, diagnostic characters of the orders and major families of economic importance. History and importance of Forest Entomology in India. Methods and principles of pest control: Mechanical, physical, silvicultural, legal, biological and chemical. Principles and techniques of Integrated Pest Management in forests. Classification of forest pests

13.208 LIVESTOCK MANAGEMENT
Credit 4

13.209 FERTILITY OF FOREST SOILS AND NUTRIENT MANAGEMENT
Credit 4

13.210 GENERAL AND FOREST MICROBIOLOGY
Credit 4
13.211 MEDICINAL AND AROMATIC PLANTS  
Credit 4  
**Content:** History, scope, opportunities and constraints in the cultivation and utilisation of medicinal and aromatic plants in India. Importance, origin, distribution, area, production, climatic and soil requirements, propagation and nursery techniques, planting and aftercare, training and pruning, nutritional and water requirements. Plant protection, harvesting, processing and economics of under mentioned important medicinal and aromatic plants. Medicinal Plants: pepper, cardamom, clove, ginger, turmeric, betelvine, periwinkle, Rauvolfia, Dioscorea, isabgol, Ammi majus, belladonna, Cinchona, pyrethrum and other species relevant to local conditions. Aromatic Plants: Citronella grass, khus grass, sweet flag (bach), lavender, geranium, patchouli, bursera, Mentha, muskdana (musk mallow), Ocimum and other species relevant to the local conditions. Endangered medicinal and aromatic plants of India and their conservation.

13.301 ENVIRONMENTAL STUDIES – II  
Credit 4  
**Content:** Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. (a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. (b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. (c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. (d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. (e) Energy resources: Growing energy needs, renewable and nonrenewable energy sources.

13.302 WOOD ANATOMY  
Credit 4  

13.303 AGROFORESTRY & SOCIAL FORESTRY  
Credit 4  
**Content:** Indian agriculture its structure and constraints. Land use definition, classification and planning. Agroforestry - definition, aims, objectives and need. Traditional agroforestry systems: Taungya system, Shifting cultivation, wind break, shelterbelts, Homestead gardens’. Alley cropping, high density short rotation plantation.

13.304 SILVICULTURE OF INDIAN TREES
Credit 4
Content: Origin, distribution, general description, phenology, silvicultural characters, regeneration methods, silvicultural systems and economic importance of the conifer and broadleaved tree species of India.

13.305 FUNDAMENTALS OF WILDLIFE & FOREST TRIBES
Credit 4
Content: Introduction: Definition of wildlife, free living, captive, domesticated and feral animals. Justification of wildlife conservation, uses, values and negative impact of wildlife. Zoogeographic regions and biomes of the world. India’s uniqueness in biodiversity, reasons and causes of wildlife depletion. Biogeographic classification of India. Status and distribution of wildlife in India. Scientific and common names of important mammals, birds and reptiles. Rare, endangered and threatened species of mammals, birds and reptiles of India. Agencies involved in wildlife conservation, Govt. and NGO’s. BNHS, WWF, Indian Board for wildlife, CITES. Biological basis of wildlife management. Basic requirements of wildlife – food, water, cover and space, limiting factors. Wildlife ecology: Relevance of basic ecological concepts such as food chain, food web, ecological pyramids, habitat, ecological niche, carrying capacity, density, prey-predator relations and population dynamics.

13.306 WOOD SCIENCE & TECHNOLOGY
Credit 4
13.307 FOREST SOIL SURVEY, LAND USE & REMOTE SENSING
Credit 4
Content: Scope and objective; soil survey, sampling methods; planning, inventory, permanent sample plots; sample size allocation, land use classes and planning. Aerial photography and remote sensing-definition, meaning, scope, merits and brief history. Electromagnetic spectrum; radiations, differential reflections by surfaces, active and passive remote sensing, earth observation satellites. Equipment and materials-aerial bases, cameras, filters, stereo scopes, computers, radars. Photo grammetry: Vertical and oblique photography. Photographs and images, scales, resolution, photo interpretation, Photo grammetry, image analysis, mapping. Agencies involved in remote sensing and acquiring information from them. Remote sensing; principles, uses in forestry, status monitoring, fire, vegetation/cover classification and mapping, species identification, height and volume – estimation. Identification of tree species and their form stand delineation. Interpretation of land forms and soils; use of micro-level survey of farm forests, large scale photos in forest inventory, site selection.

13.308 NURSERY MANAGEMENT AND SEEDLING PRODUCTION
Credit 4

13.309 FOREST UTILIZATION
Credit 4

13.310 WILDLIFE MANAGEMENT & BIOSPHERE
Credit 4
Content: History of wildlife management and conservation in India; cultural background. Habitat management: Purposes, principles, practices and tools-fire, cutting,

13.345 PROJECT
Credit 4