

FOREST RESEARCH INSTITUTE (DEEMED) UNIVERSITY DEHRADUN

M. Sc. FORESTRY BROCHURE





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From the Vice Chancellor Desk

The Forest Research Institute (FRI), founded in 1906, is a premier Institute in the field of forestry research and education. FRI, one of the Institutes of the ICFRE, Dehradun, was conferred the status of University in the year 1991 on the recommendation of the UGC, Ministry of HRD, Government of India.

The M.Sc. Forestry course started in 1991 is designed to train students as future foresters and provides an upto-date knowledge on forestry practices all over the world. New and relevant courses like GIS and Remote Sensing, Wildlife Management and Protection, Eco-development and Tourism, Marketing Systems and Project Formulation have been added to supplement the already existing syllabus that includes traditional streams of forestry such as silviculture, management and mensuration. Equal emphasis is maintained on course work and field exposure during the entire course.

The faculty of the course includes eminent scientists and field officers having a long experience of teaching and research. The course is well equipped to handle the ever dynamic field of forestry and also exposes the students to silviculture, management and protection related issues.

On behalf of the Institute, I invite Corporates, NGOs, and other employers to assess the caliber of our budding foresters. They are an integral part of the century-old tradition of forestry in India. I wish the students of M. Sc. Forestry the very best in their careers.

Forest Research Institute



M. Sc. Forestry



About the University

Forest Research Institute (FRI), Dehradun has its roots in the erstwhile Imperial Forest Research Institute (IFRI) started in 1906. The Institute was established basically to organize and lead forestry research activities in the South Asia. The Institute also administered training to forest officers and forest rangers in the country. After Independence, IFRI was aptly renamed as Forest Research Institute and Colleges. After successfully playing the lead role in forestry sciences, in 1988 this forestry research set up was reorganized to meet the new dimensions of forestry research and education in the country. The FRI and its research centers were brought under the administrative umbrella of the newly created Indian Council of Forestry Research & Education (ICFRE) under the Ministry of Environment and Forest, Government of India. To fulfill premier needs of forestry and environment professionals in the country, the premier Forest Research Institute was conferred the status of Deemed University in 1991 by University Grants Commission (Under section 3 of UGC Act 1956 vide notification no.F.9-25/89-U3 dated 6-12-1991). Since 2006, it is known as Forest Research Institute University. The FRI (Deemed) University is an ISO certified organization.



OBJECTIVES

- To impart education in different branches of forestry and environment.
- To provide facilities for research and development and dissemination of knowledge in the field of forestry and environment.
- To create consciousness about forest and environment among people through forestry extension programmes.
- To carry out such other activities as may be necessary and desirable for further safeguarding of environment and protection of forests and wildlife.

COURSES

M.Sc. Forestry

The academic requirement for this course is B.Sc. with at least one of the subjects from Botany, Chemistry, Geology, Mathematics, Physics and Zoology or B.Sc. in Agriculture or Forestry.

M.Sc. Wood Science & Technology

The academic requirement for this course is B.Sc. with Physics, Chemistry and Mathematics or B.Sc. in Forestry.

M.Sc. Environment Management

The academic requirement for this course is B.Sc. in any branch of basic or applied Sciences or Bachelor's degree in Forestry or Agriculture or BE in Environment Sciences.

M.Sc. in Cellulose & Paper Technology

This course is proposed for students who are graduates in Science with Chemistry as one of the subjects or BE/B.Tech (Chemical or Mechanical Engineering).

P.G. Diploma in Aroma Technology

This course has been launched in collaboration with Fragrance & Flavour Development Centre, Kannauj and is introduced in India first of its kind in our country. Duration of course is 1 year. The course intends to train students for aroma industry. The first semester is taken up at Forest Research Institute and the second semester practical training is imparted at FFDC, Kannauj, thereby developing the entrepreneurial skill of the students by FFDC, Kannauj. For more information on FFDC website (www.ificindia.org) may be accessed.





SAARC FELLOWSHIP

Hon'ble Prime Minister Dr. Manmohan Singh in his address to the 17th SAARC Summit announced to provide 10 scholarships per year to SAARC nations for post-graduates and doctoral studies in forestry courses at the Forest Research Institute University, Dehradun. The SAARC fellowships are being provided to SAARC Country students from 2012.

SCHOLARSHIP

FRI University provides merit scholarship to the topper students in each course. The scholarship is half of the fee of semester. For the purpose of award of scholarship in the first semester the result of the entrance test is considered and the topper in general and SC/ST category are awarded the scholarship in each course.

CULTURAL ACTIVITIES

Students from different parts of the country having different cultural backgrounds join the University. A Student club gives them opportunity to present the rich heritage of their area during the annual cultural program. Every year students show their talent with great zeal.

HOSTEL

Separate hostel facilities for boys and girls are available within the campus. The hostel has well equipped gym and basket ball, badminton, lawn tennis and table tennis courts. Round the clock internet facility is available in the Hostel.

SPORTS AND GAMES

FRI University has all indoor and outdoor games facility like chess, badminton, table tennis, basketball, lawn tennis, cricket, football and hockey etc. in the campus. Every year annual sports are organized by the University during which the students show their talent. The outstanding students get opportunity to participate in annual All India Forest Sports Meet.

MEDICAL FACILITIES

The university has its own well equipped 30 bed hospital with qualified doctors and para-medical staff. Round the clock medical facilities with ambulance services are available.

TOURS AND VISITS

Students of all courses visit different parts of the country to get practical exposure of different sites related to the wood science, paper technology, forestry and environment as a part of their curriculum. The students are also attached with reputed Industries/Institutions to complete dissertation for three to four months duration to familiarize them with the practical difficulties and latest technologies of the industries.

WORKSHOP/SEMINARS

To acquaint the students with the latest technologies in Forestry they are encouraged to participate in various workshops/seminars organized by different Divisions of FRI in their National and International funded projects.

DOCTORAL PROGRAM

A student can pursue research and studies leading to an award of Ph.D. degree at FRI (Deemed) University or any of ICFRE research centre established all over the country. The research facilities in the field of forestry and allied subjects at the FRI (Deemed) University are amongst the best in the country. At present over 250 research scholars are registered for Ph.D. at the FRI (Deemed) University. Till now 566 Ph.D. degrees have been awarded.

The application for Entrance test and other relevant information are available on the website www.icfre.gov.in.



HISTORY

The progress of forestry research in India is interwoven with the early management of forests after 1864, when the Indian forest department was established. During the initial stages forest management practices were gradually strengthened by scientific curiosity of early foresters in laying out trials for develop appropriate techniques of forestry practices. Central Forest School was founded in 1878 for training of rangers at Dehradun. In 1884 the Govt. of India took over the management of this school from the Govt. of North-West Provinces and renamed it as Imperial Forest School and placed it under the supervision of the Inspector General of Forests. Forestry research started from an Indian plant chemistry laboratory. In 1906, Imperial Forest Research Institute (IFRI) was created at Dehradun, later on named as Forest Research Institute and Colleges (FRI&C), to become the premier institution of forestry research in the country. The grandiose FRI building with offices and laboratory space of about 5,800 sq. m. and six museums covering 2,400 sq. m., was build with a cost of Rs. 56 lakhs over a plinth area of 7 acres and was inaugurated in 1929 by Lord Irwin.

DIVISIONS OF THE UNIVERSITY

The University is organized into the 16 Divisions:

1. BOTANY

Botany Division is one of the six disciplines established in 1906 in the erstwhile Imperial Forest Research Institute. The division is aimed at carrying out forestry research activities in the subject of Forest Botany under its five disciplines namely; Systematic Botany, Plant Physiology, Wood Anatomy, Bioprospecting & Biopiracy and Tissue Culture.

Herbarium, Xylarium, Carpological Museum, Botanical Garden, Bombusetum, Tissue Culture units, Rare and spectacular plants conservatories, Vegetative Multiplication Garden, Clonal Seed Orchards are repositories of the division for R&D, educational and extension activities. Wood Anatomy deals primarily with the structure and classification of wood by studying the anatomical structure, it is possible not only to determine the correct identity of a timber but also to roughly assess its quality and suitability for various end-uses.

2. CELLULOSE & PAPER

Cellulose and Paper Division has an impressive record in conducting research and development in the field of pulp & paper technology since 1909 when Sir William Rait, the paper technologist, initiated studies on evolving efficient and economic process for preparation of easy bleaching pulp from bamboo. Since then the division has worked for the production of high yield pulping process, improving of high yield pulping, degradation of lignin, beater/wet additives, development of specialty paper and sponsored research projects from Indian Pulp & Paper Industry and Khadi & Village Industries Commission.

3. CHEMISTRY DIVISION

Chemistry Division has a very long record of carrying out research in Chemistry of Forest Products towards utilization and promotion of wood and non wood forest products important for development of essential oils, medicinal products, nutraceuticals, fatty oils, tannins, dyes, biopesticides, gums; resins, starches, waxes, cellulose, etc.; having a laboratory equipped with modern instrumentation facilities.

4. FOREST ECOLOGY AND ENVIRONMENT

Ecology & Environment Division came into existence in 1948 under the directorate of Silviculture Research. The division applies multidimensional research on structure and functioning of forest ecosystem, wetland ecosystem, ecosystem services, biodiversity conservation, rehabilitation and management of disturbed lands and pollution abatement through vegetation.

5. FOREST ENTOMOLOGY

Forest Entomology Division is one of the six founder branches of FRI, established in 1906. The renowned National Forest Insect collection having its unique insect collection mainly of Forestry importance. It has about 18,000 authentically identified forest insects' species which include 1,800 type specimens. Collection has more than 3,00,000 pinned specimens of forest insects and world class Museum which depicts approximately 3,000 of wood samples degraded or damaged by wood boring / wood feeding insects.

6. FOREST PATHOLOGY

The work on forest pathology initially started in Forest Mycology Section under Botany Branch in 1927 and later was elevated to a full-fledged branch in 1950. The Branch was renamed as Forest Pathology Branch in 1957. The Division has collection of nearly 12000 specimens of diseases and pathogens in its Museum and Herbarium and also a culture collection of about 1000 live fungi at National Type Culture Collection. The Division also provides identification



services for diseases, fungi, decay in wood samples.

7. FOREST PRODUCTS

Forest Products Division is one of the oldest establishments in the Institute & the repository of basic and applied data on 'Wood Science and Technology in India. The Department covers all aspects of the research and testing of wood-based materials from raw materials to final products. Our research intensively focuses on R & D aspects of Timber Mechanics, Composite Wood, Wood Seasoning, Wood Preservation, Timber Engineering, Wood Working & Finishing estimating the feasibility of wood-based materials for different end uses.

8. FOREST SOIL & LAND RECLAMATION

Scientific investigations on Forest Soil were initiated in the early forties through the formation of Soil Section which was upgraded to Forest Soils Branch. The branch is devoted to the research on soil physical, chemical and mineralogical investigations.

9. GENETICS AND TREE PROPAGATION

The Division of Genetics and Tree Propagation was established in 1959. The division carries out research on the genetic improvement of different forest tree species including medicinal plants through concepts of genetics, tree breeding and biotechnology. Modern facilities are available for advanced genetics and molecular marker research with molecular biology laboratories and vegetative propagation complex.

10. NON WOOD FOREST PRODUCTS

The Non-Wood Forest Products Division is one of the oldest division. In 1906 economic research on minor forest product was entrusted to the economic branch under the leadership Mr. R.S. Troup. Quality work has been conducted on major NWFPs of socio economic importance like leaves, bamboo, canes, gums, resin, oils, fibre, flowers, tannins, dyes and most importantly medicinal plant wealth.

11. RESOURCE SURVEY AND MANAGEMENT

A forest Economic Branch was created at the erstwhile Imperial Forest Research Institute at Dehradun as early as in 1906. This branch included the research on Forest Mensuration and Management & is continuing its work today under the division of the Resource Survey & Management.

12. SILVICULTURE

Silviculture Division was one of the six research disciplines to have been started at the initiation of forestry research at the institute. Nursery and planting techniques of 550 important commercial species of trees, shrubs and bamboos have been developed. Museum, seed laboratory, Clonal Seed Orchard, Vegetative Multiplication Garden, plantation trials, central nursery and divisional nurseries are being maintained by the division.

13. BIO-INFORMATICS AND GIS

The Forest Informatics & GIS Division consists of IT Cell, Geomatics Cell and Bio-Informatics Centre, was created in 2008 to cater the latest needs of students & Research scholars also. The division also gives its services to various State Govt.

14. CLIMATE CHANGE AND FOREST INFLUENCES

The division is established to study the Climate Change and Forest Influences of our environment including the topics i.e. Carbon sequestration, Vegetation shifts, EIA, REDD, etc.

15. EXTENSION

The aim of the division is to organize and facilitate the trainings for smooth and effective dissemination of different technologies to target groups including farmers SHGs, NGOs and SFDs etc. The division was created for lab to transfer.

16. NATIONAL FOREST LIBRARY & INFORMATION CENTER

Richest document collection on forestry & environment in Asia. More than 1,65,000 books, 7000 ledger entries with research articles and foreign and Indian Journal subscription.



About the Course

SILVICULTURE

Definition and objectives of study of silviculture. Forest Types in India, Extent of forest in India, in relation to other countries. Importance of forest. Locality factors, biotic factors, Susceptibility of forest to damages, destructive agencies. Demonstration and Field Excursions.

SILVICULTURAL SYSTEMS

Classification of silvicultural systems. High forests and coppice systems. Changing concepts in silvicultural systems. Clear felling. Selection system tending operations in the natural forests/plantations including weed management cleaning, Silviculture of some important suitable Spp. Joint Forest Management/Community forestry.

FOREST NURSERY AND AFFORESTATION TECHNIQUES

Site selection, type, design and layout. Nursery soil and water management. Production schedule. Macro and micro-propagation. Propagation structures: shade house, poly house, mist chambers and growth chambers.

PLANTATION FORESTRY

Plantation silviculture native vs exotics. Single species plantations vs mixed plantations vs multiple purpose tree (MPT) plantations. Selection of planting stock. Rotations and regeneration.

PEOPLE AND FOREST

Forests in rural development. Various strategies, micro-level planning & PRA. Tree architecture: Tree landscaping: Elements of bioaesthetic planting and landscaping, choice of species and sites.

SOCIAL FORESTRY

Social and community forestry concepts, variations, and their role in rural, tribal and urban development. National forest policy. Choice of species and management of social forestry plantations. Management of community lands. Designing of agroforestry systems.

FOREST MENSURATION

Scope and objectives. Measurement of tree diameter, height, girth, bark thickness, weight, tree cross-sectional area, form, crown width, empirical formulas, methods and instruments used, calculation of log volume. Volume estimation of standing trees, Determination of age, Measurement of crop.

STATISTICS AND RESEARCH METHODS

Basic statistical Methods; importance of statistics in Forestry: Presentation and data-compilation, tabulation. Analysis of variance: One way/two-way classification. Sampling Techniques. Design of Experiment.





REMOTE SENSING AND GIS

Basic principles, types and scope of remote sensing. Introduction to aerial photography and photogrammetry. GIS and its use in Forest management. Forest inventory planning, design, alternatives, execution, compilation and reporting.

COMPUTER APPLICATION

Microsoft Office : Microsoft Word , Microsoft Excel , Microsoft Power Point, Microsoft Access

FOREST PROTECTION

Principles of forest protection; factors affecting forest health outbreak of diseases and insect attack; droughts and floods; anthropogenic activities, pollution; biotic pressures urbanization and industrial expansion.

FOREST BIOLOGY

major classification of forest plant; Phenology: Seed morphology: Forest fungi: Histology-Tree physiology, Respiration, Tree Genetics.

SOIL SCIENCE

Concept and definition of soil; Factors and process of soil formation; Soil profile and its development under different climate/topography and vegetation. Properties of soil.

ENTOMOLOGY & PATHOLOGY

Introduction to forest Entomology in relation to forests and forest produce. Type of disease, symptoms and Koch postulates plantation and nursery diseases and their management; damping off/leaf blights, seedling blights, rusts, mildews, leaf spines.

FOREST ECONOMICS

Marketing and Financial Management-Role of marketing in open market economy. Marketing functions, Principle of credit and its classification. Balance sheet and its role in financial management. Project Formulation, Monitoring and Evaluation, Project: Concept, components, preparation and analysis. Cost and benefit streams. Investment analysis at farm/forest and industry levels. Measures of project worth: Comparing costs and benefits.



FOREST RESOURCE UTILIZATION (NON-WOOD)

Non-timber forest products, Non-timber forest products of India and their importance in rural and industrial economy; fiber and flosses, grasses, bamboos, medicinal plants and canes, their distribution, cultivation, harvesting, processing and uses; essential oils, commercial importance and the methods of cultivation of soil bearing plants.

WOOD

Wood seasoning and preservation; Introduction, need and importance of seasoning and preservation; general principles of seasoning; air and kiln seasoning, solar dehumidification, steam heated and lacertal kilns. Composite wood adhesives-manufacture, properties, uses. Wood Based Industries; classification and grading of Indian timbers for various wood based products.

FOREST POLICY & LAW

Forest Policy; foundation, need and scope. National Forest policies of 1894, 1952 and 1988. Indian Forest Act 1927; Forest (Conservation) Act 1980 and Rules 2003, Environmental (Protection) Act 1986. Indian Penal code, Cr P.C. CITES, CBD, ITA, UNFCCC, Kyoto Protocol TRIPS etc

FOREST ECOLOGY & ENVIRONMENTAL CONSERVATION

Forest Ecology, Ecology and Ecosystem concept, basic ecological principles and concepts of forest ecology, forest environment, forest community, forest succession.

Environment: components and importance. Principles of Environmental conservation. Impact of deforestation, forest fires, mining and other disturbances on environment. Environmental impact Assessment of projects. Concept of sustainable development.

FOREST MANAGEMENT

Objectives and principles; History, Principles and Practices of Forest Management, sustained yield, yield and its regulation; forest valuation, appraisal of forest damage National Working Plan Code.

WATERSHED MANAGEMENT

Soil and water conservation; Types, causes and factor affecting soil erosion land capability classification, general practices for soil and water conservation mulching, Concept of watershed management,

WILDLIFE MANAGEMENT AND ECO-DEVELOPMENT

Biodiversity and Wildlife. Objects of Conservation, life support systems. Principles of management, animal-habitat studies, conservation biology, wildlife behavior studies, Wildlife (Protection) Act, 1972. and Amended Act 2002. Wildlife Management Plan.

RANGE MANAGEMENT

Grass lands and ranges of India and of the State. Sources gap between optimal requirement and present availability. Principle and practices of range land management. Improvement of range productivity by vegetation manipulation. Grazing system and rotational nomadic.

DISSERTATION

Four month's attachment in the Organizations/Institutes of National and International repute in the following subjects:

1. Forest Biotechnology
2. Forest Entomology
3. Forest Management
4. Remote Sensing & Geographic Information System
5. Wildlife Management & Eco Development
6. Wood Science & Technology



FIELD VISITS

Parks & Sanctuaries

Bandipur National Park (Karnataka)
Bannerghatta National Park (Karnataka)
Great Himalayan National Park (Himachal Pradesh)
Jim Corbett National Park (Uttarakhand)
Kedarnath Wild Life Sanctuary (Uttarakhand)
Mudumalai National Park (Tamil Nadu)
Panna and Kanha National Parks (Madhya Pradesh)
Rajaji National Park (Uttarakhand)
Silent Valley National Park (Kerala)



Institutes

ICRISAT, Hyderabad
N. R. S. A., Hyderabad
C. F. T. R. I., Mysore
I. I. Sc., Bangalore
I. I. P., Dehradun
I. I. R. S., Dehradun
I. W. S. T., Bangalore
I. F. G. T. B., Colimbatore
National Institute of Oceanography, Goa
Wildlife Institute of India, Dehradun
Y. S. Parmar Unh. of Hort. & Forestry, Solan

Exposure

Sand dune rehabilitation & restoration
Watershed management
Management of high coniferous forests
Reclamation of mining areas
Social forestry and Urban forestry
Joint Forest Management practices
Captive breeding programs Wetlands and Salt marshes
Eco-tourism destinations





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