

Dept. of Forest Resources

The Science of Forest Resources is an essential basis for economy, environment, and other social and cultural assets in Korea, where 63% of the land is occupied with mountainous forests. In association with enormous benefits produced from the forests, graduate students will find wide and substantive strata for studies on the values, services, and products of the forests. Educational goal for the Department of Forest Resources is to teach students for them to learn professional skills and knowledge that would help to maintain Korea's forest ecosystem healthy in a sustainable manner. The department takes full advantage of the state of the art knowledge and science to achieve this goal. To list a few, biotechnology, remote sensing, GIS (Geographic Information System), ecosystem approaches, and most up-to-date forest survey methods are the disciplines to attain the goal.

One of the main objectives of the Master and Doctor of Science program in the Forest Resources Major is to provide ample opportunities for students who aspire to have professional careers. The curriculum offers them a variety of knowledge from the basic to the applied aspects for their specialization, as well as interdisciplinary and global environmental issues such as climate change from ecological and social perspectives. The graduates of the department, in general, are working as public foresters, researchers, or managers of forestry, to name a few.

Courses

Forest Resources Major Courses

- **Topics in Forest Environment and Resources (3)**

This course teaches the methodology for sustainable management of forest environment and resources. It also discusses issues to apply these methodologies and to reflect them in forest policy.

- **Topics in Forest Ecology (3)**

This course comprehensively interprets the structure and function of forest ecosystems and discusses how such knowledge can be utilized in forest ecosystem management.

- **Thesis Research (3)**

Students will learn an overall process and system of methodologies in conducting forest science research. Topic selection, research design and planning, literature search and review, actual analysis, delivery and review of results will be covered in this lecture. Students will have an opportunity to practice writing scientific proposals and reports through critical group review.

- **Topics in environmental GIS (3)**

Students will learn advanced GIS analysis techniques and their applications to decision-making for sustainable forest management.

- **Ecological Informatics (3)**

This course investigates the advanced statistical theories and methodologies in ecological research. Topics include hypothesis testing, correlation and regression analysis, analysis of variance, and time-series analysis. Students will learn the theoretical backgrounds and programming skills to effectively apply such methods for research.

- **Topics in Forest Culture (3)**

Analyzing the impact of forest on cultural development and civilization. Areas of emphasis in history, philosophy, literature, art and religion.

- **Topics in Silviculture (3)**

This course will analyze the factors and processes affecting the growth and development of the forest stand, and also comprehensively discuss the issues related to the establishment, maintenance and regeneration of the stand.

- **Topics in Forest Management (3)**

In this course, principles of forest management for sustained yield system are mainly dealt with. The methodologies of both stand-level management planning and forest-level management planning are presented. The stand-level management planning includes growth and yield modeling, management decisions, and decision criteria for managing future and current even- and uneven-aged forest stands. In the forest-level management planning, traditional forest regulation concepts, harvesting scheduling, and multiple-use management are discussed.

- **Forest Education (3)**

Development explanation skills about forest and nature, including view of culture, ecology, geography, and scenery. Examination and analysis of overall process required to become 'forest interpreter' and 'nature interpreter'.

- **Tree Physiology (3)**

This course includes the anatomy, nutrition, metabolism and growth regulation of wood plants. Major topics are woody plant meristems, structure and function, water relations, internal carbon cycle, and growth regulation.

- **Urban Forestry (3)**

This course will discuss forestry activities in urban areas and the relationships between civil society and urban forestry during the 4th Industrial Revolution.

Students also discuss methodologies to promote urban forestry.

- **Topics in Wildlife Ecology (3)**

This course will discuss quantitative analysis and interpretation of wild life ecology and management and changes in wildlife populations, communities and habitats by human impact.

- **Topics in Environmental Remote Sensing (3)**

Students will learn techniques to monitor the environment using various satellite image data and investigate effective environmental information management in connection with GIS.

- **Topics in Dendrology (3)**

To develop and maximize the potentials for using trees as resources, theories on the classification and identification of trees including the issues on distribution, ecological characteristics, and usages of them are taught. Emphasis is placed on specific usages of trees as medicines, foods, ornaments, and environmental resources for further discussion.

- **Restoration Ecology (3)**

Theories on the restoration and rehabilitation of the structure, function, and development of ecosystems destroyed by anthropogenic as well as natural disturbances are taught and the examples of restored and rehabilitated ecosystems are introduced for further discussion.

- **Topics in Ecology and Environment (3)**

This course will discuss global ecological and environmental issues, their impacts on our lives, and the importance of trees and forests in these issues.

- **Landscape Ecology (3)**

Theories on the structure, function, and development of landscapes including diverse array of ecosystems are taught and practical examples in the preservation of natural ecosystems and conservation natural resources are introduced for further discussion in restoration and rehabilitation of degraded ecosystems in Korea.

- **Plant Information and Database (3)**

To develop and maximize the potentials for using plants as resources, theories on the conservation, protection, utilization, and preservation of them including botanical and ecological issues on the classification, identification, distribution, habits, and usages of them are taught. This course also carries out a project to collect plant-related information and database it.

- **Topics in Forest Measurement (3)**

This course deals with theory and technique of forest measurement required in basic data survey for research. The measurement methodology of growth and yield for both individual tree and forest stand will be considered based on advanced theory and computer application. Also, the latest topics in the field of forest measurement will be discussed.

- **Management of Natural Environment (3)**

Theories on the conservation, preservation, utilization, and restoration of natural environment including diverse array of practical application are taught. The ecology and practices in the preservation of natural ecosystems and conservation natural resources are introduced for further discussion in the management, restoration, and rehabilitation of degraded ecosystems and environment in Korea.

- **Urban Environmental Management (3)**

This course discusses the critical issues and management of urban environment and also discusses ways to make efficient use of urban environmental resources.

- **Ecological Methodology (3)**

This course emphasizes on statistical application to research problems of ecological studies. The contents of lecture include basic concepts of statistical models, use of samples, measures of variation and central tendency.

- **Growth and Yield (3)**

The focus of this course is on discussing the relationship between tree growth and yield. This course deals mainly with principles of growth and yield by species and locality. Based on statistical theory, also, the methodology of developing growth and yield models is lectured throughout actual research case studies. The application method of the models will be discussed for the rational forest management.

- **Topics in Forest Engineering (3)**

This course deals with some big issues concerning forest road, tree harvesting, mountain erosion control. Especially, it focuses on relationship of forest road with tree harvesting and mechanization, forest labor and ergonomics, hydrological and civil engineering against erosion in mountain forest area.

- **Forest Recreation and Tour Planning (3)**

In order to cope with forest tourism demand in forest areas, students will learn the possibilities of mountain forest in aspect of forest community and ecology. Thereafter they study how to approach to the recreational planning and designing in harmony with mountain forest area.

- **Eco Healing and Therapy (3)**

Forest therapy is a activity physically and spiritually promoting the human health

through physiological, sensory, and mental response between human organs and various natural factors(landscape, sound, aroma, phytoncide, negative ions, light, climate, topology, etc) in forests. This course deals with healing mechanism and application methods of elements related to forest healing and therapy.

- **Ecospace Planning (3)**

In accordance with increase of social demand for forest developments, the woodlands in the area of suburb are seriously opened up and it damages the forest landscape quality visually and emotionally. This subject deals with issues caused by such engineering works as forest road, golf ground, ski slope, quarry, etc., and harvesting and logging operations. It aims to find out some methods which can environmentally and soundly restore the damaged woodland sites.

- **Planning for Forest Landscape (3)**

This course is designed to understand the social demand for forests and development activity, and propose a model for solving problems through providing a plan for constructing aesthetic landscape and recreational space. In this procedure, students have to research the possibilities of mountain forests in historical and ecological aspect. Based on these observations, they will approach to the spatial planning in harmony with mountain forest environment.

- **Spatial Analysis and Statistics (3)**

This course will provide important theories on spatial analysis and statistics, along with practical training on statistical tools and programming in R.

- **Forest Genetics and Pathology (3)**

This course is designed to understand the ecological roles of biological and environmental factors that cause the disease in forests and develop approaches for predicting, preventing, and managing tree pathogens. Methods to identify forest pathogens and examine host-pathogen interactions will be reviewed for applications to maintain forest health, sustainability, and resilience of diverse forest ecosystems.

- **Ecosystem Service Assessment (3)**

Ecosystem service indicates the totality of the various benefits ecosystem provides to humankind. For sustainable development and ecological conservation, it is critical to understand ecosystem service and properly evaluate its values to assist decision making. This lecture provides the fundamentals of the concept of ecosystem service, tools to evaluate and model ecosystem service, and real-world examples on how this approach is applied.

- **Seminar in Ecological and Environmental Informatics (3)**

This course is a student-centric seminar focusing on collecting, preprocessing, analyzing and discussing ecological data. This lecture aims to enhance students' research capacity

through comprehensive approaches and interpretation of ecological data.

- **Topics in Environmental Big Data Processing (3)**

This course will provide the concepts and theories of preprocessing and analysis of environmental big data, and cultivate the ability to analyze various big data through environmental big data analysis practice.

- **Ecosystem Function and Biodiversity (3)**

This course learns concepts and theories about the structural functions and characteristics of ecosystems. This lecture also discusses the concepts of biodiversity and the relationship between ecosystem function and biodiversity.

- **Forest Health Management (3)**

Major topics covered by the course include forest pest (disease and insect) and fire, how these factors interact with each other and their environment within forest ecosystems, and how to manage healthy forests for sustaining resilient forest ecosystems.

- **Disturbance Ecology (3)**

Ecological disturbances are critical in understanding the dynamic nature of ecosystems and vegetation change. Disturbances can occur in a variety of spatial and temporal scales, with varying intensity and frequency. Such characteristics can play an important role in determining the structure and function of any particular ecosystems. In this course, students will learn the theoretical background and current research on disturbance ecology, with a chance to experience several quantitative and modeling approaches.

- **Ecological Modeling (3)**

Forest ecology consists of various components and relationships among them, and its functional characteristics are determined by the complex interactions between such components. Modeling approach is a useful tool to understand such complex systems, and to predict and/or project system behaviors, and to facilitate planning for management. This lecture will provide theoretical background and practicum for various existing modeling platforms and modeling approaches in the field of forest ecology.

- **Topics in Urban Ecology (3)**

Ecosystem service indicates the totality of the various benefits ecosystem provides to humankind. For sustainable development and ecological conservation, it is critical to understand ecosystem service and properly evaluate its values to assist decision making. This lecture provides the fundamentals of the concept of ecosystem service, tools to evaluate and model ecosystem service, and real-world examples on how

this approach is applied.

· **Topics in Climate Change and Forest (3)**

Climate change is one of the major changes we face, now and in the future. It will influence not only the atmospheric condition of the Earth, but the entirety of the ecosystem and how humans live. Due to the complexity of the phenomenon, the outcomes of climate change can be unpredictable and complicated. This lecture explores the current research trends related to climate change and discusses effective ways to adapt and mitigate climate change through forests.

□ **Faculty Members**

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