

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 64% 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

• **Administration of Forestry & Environmental Organization (3)**

The subject is divided into two parts. Part one is that administration in forestry treats of the performance, business operation and implementation policy about public forestlands. Part two provides governmental and non-governmental organization on how environmental policy should be managed in Korea and the related nations.

• **Forestry Biology and Silviculture (3)**

Discussion of individual tree structure and growth, physical environment of trees and forests, and introduction to different regional forest communities. Manipulation of forest vegetation based on natural regeneration for the production of goods and services.

• **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.

- **Special Topics in Ecosystem Ecology (3)**

Theories on the structure, function, and development of ecosystems are taught and studies on the energy flow and nutrient cycling are reviewed for further discussion in sustainable management of forest resources.

- **Research Planning in Forest Science (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 Forest and Humanity (3)**

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

- **Forest and Nature Interpretation (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 Growth Development (3)**

Integration of vascular plant anatomy, nutrition, metabolism, and growth regulation specific to wood plants. Major topics include woody plant meristems, structure and function, water relations, internal carbon cycle, and growth regulation.

- **Social Forestry (3)**

Detailed analysis of the influence of the forest on civil society. View of social relation between civil society and forest.

- **Geoinformatics in Forest Resources (3)**

Focuses on the required background for remote sensing, GIS, digital photogrammetry and GPS in the new geoinformatics concept in the discipline-oriented and the methodology-oriented forest applications including introduction to LBS application.

- **Modeling of Forest Socioecology (3)**

Quantitative techniques used in socioecological Forestry. It provides insight into sustainable forest management(SFM) planning of forested lands. From model specification described in spatial information.

- **GIS Application of Forest (3)**

Recent advances in geographic information systems (GIS) to directly address specific analysis or management in forest resources. It includes fundamental scientific problems and decision support tool in GIS applications.

- **Human Impact in Wildlife Ecology (3)**

Presenting the available management of how endangered and threatened species relate to their habits. Details the role of predators in ecosystems and landscape ecology. It deals also with understanding between preservation and hunting which may be used to help manage "desirable" and "undesirable species.

- **Satellite Environmental Monitoring (3)**

This subject is to designed to meet observation techniques of various kinds of earth environment and to promote basic researches to understand the mechanism of the variations of earth environment based on earth observation information from space.

- **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.

- **Tree Resource & 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.

- **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.

- **Forest and Environment (3)**

Theories on the relationship between forests and air pollutants are taught and measures for mitigating the damages caused by the air pollutants are introduced for further discussion. Emphasis is placed on the diverse aspects including the mechanisms of source-sink and dose-response relationships of air pollutants with forests.

- **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.

- **Management of Plant Resources (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. Emphasis is placed on specific usages of natural plants in Korea as medicines, foods, ornaments, and environmental resources for further discussion.

- **Special Topics in Environmental Pollution Management (3)**

In order to wisely manage pollutants contained in the trees and the other biotic organisms and the abiotic environment in the air, water, soil, etc., in the forest ecosystems, lectures are focused on the understanding of the dynamics of them and the measures how to control them wisely in view of sustainable management of forest ecosystems.

- **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.

- **Forest Mensuration (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.

- **Advanced Biostatistics (3)**

This course investigates the advance statistical theories and methodologies relevant to biological studies. Methodologies such as hypothesis testing, correlation analysis, regression analysis, analysis of variance, time-series analysis are covered, and will provide effective tools, theoretical backgrounds, and statistical programming skills

for academic research.

- **Environmental and Resource Economics (3)**

This course provides a variety of critical perspectives on how current environmental issues. Students will learn how to view environmental problems under an economic perspective, with particular focus on efficient and general usage and management of forest resources, and to develop models to handle such issues.

- **Experimental Statistics (3)**

This course emphasizes on statistical application to research problems of forestry. The contents of lecture include basic concepts of statistical models, use of samples, measures of variation and central tendency. Statistical analysis techniques such as test of hypothesis, analysis of variance, regression and correlation are discussed with actual research data. Also, the technique of computer programs will be provided to enhance the ability of statistical analysis.

- **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.

- **Special Topics in System Engineering in Forestry (3)**

This study 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.

- **Design Theory for Forest Trails (3)**

This lecture is **closely** related to special topics in forest system engineering and forest landscape planning. Students review forest management, tree harvesting, forest recreation, and then research how to plan and design the forest management trail and the forest recreational trail as forest road, logging trail, recreational trail, nature experience trail, etc.

- **Recreational and Tour Planning for Mountain Communities**

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

- **Design of Forest 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.

- **Environmentally Sound Site 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.

- **Forest Genetics (3)**

To understand principal concepts of forest population genetics, molecular genetics, and ecological genetics and apply these genetic concepts for making decisions in tree improvement and species conservation & management strategies .

- **Forest Pathology (3)**

To obtain knowledge on basic concepts of forest pathology and identify major forest diseases in the world, especially Korea and US. And, to understand the impact of forest disease under climate change scenarios.

- **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.

- **Forest Molecular Biology (3)**

Concepts and methods of advanced forest molecular biology research will be discussed for potential application of population genetics, phylogenetics, and genomics/transcriptomics to maintain forest health and conservation.

- **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.

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

Ecological phenomenon is often dynamic and heterogeneous across time and space. Such diversity and heterogeneous nature of ecological phenomena has drawn significant interest in the field of ecology. This course will provide several important theories on spatial analysis and statistics, along with practical training on how to use actual statistical tools and programs to conduct the relevant analyses.

- **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.

- **Ecological Management and Ecosystem Service Valuation (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.

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

Urban ecology is a study of the complex system of human, flora and fauna, natural and artificial environments, their organizations, and the interactions between the components. Sustainable urban management can only be possible with the consideration of the unique characteristics of the urban ecosystem. This lecture provides the theoretical background of the nature of the urban ecosystem components, their dynamics and interactions, and provide the mainstream perspective to critically assess sustainable urban planning.

· **Special Topics in Climate Change (3)**

Climate change is one of the major change 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 provides the advanced scientific foundation of climate change, and how it will influence human livelihood and ecological integrity of the biosphere.

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