

EASTERN MACEDONIA AND THRACE INSTITUTE OF TECHNOLOGY
SCHOOL OF AGRICULTURE TECHNOLOGY
DEPARTMENT OF FORESTRY AND NATURAL ENVIRONMENT MANAGEMENT

STUDY GUIDE

The Department of Forestry and Natural Environment Management is part of the School of Agricultural Technology of the Technological Educational Institute (TEI) of Kavala at Drama.

The Department of Forestry and Natural Environment Management aims at offering Forestry and Natural Environment Works education at the highest level of applied scientific knowledge, while promoting modern forest technological skills.

The Department actively participates in European Research Programs and makes a valuable contribution to applied forest research in Greece. It also develops collaborations with other higher Education Institutes in Greece and other countries, as well as collaborations with Agencies and businesses related to the forestry field.

The Department of Forestry and Natural Environment Management consists of two Sectors:

1. The Sector of Natural Environment Works
2. The Sector of Natural Environment Protection and Management

COURSE DESCRIPTION

The duration of the basic studies in the Department of Forestry and Natural Environment Management is eight (8) semesters of study, including six months of practical placement. Every academic year consists of the winter and spring semester of studies.

All the first- year students enroll in September. However, half of them start their studies in the Winter Semester (starting in September) and the rest of them in the Spring Semester (starting in February).

Every student should select the subjects to attend in each Semester from the course list below. Usually, the students select the subjects of the Semester corresponding to their level of studies.

All the subjects included in the course list are classified in two categories:

- a. Compulsory Subjects
- b. Compulsory Option Subjects. Students should select accordingly as indicated in the course list.

From the content point of you both compulsory subjects and compulsory option subjects are classified in four categories:

1. General Subjects
2. Specific Subjects
3. Specialization Subjects
4. Economics and Management Subjects.

The subjects that are related compose groups of chain subjects, known as "prerequisite" subjects. This implies that students can select from the groups of chain subjects in a hierarchical order, that is, only after they have achieved a passing grade in the prerequisite subjects. Prerequisite subjects are listed in the course content list below.

Teaching in the Department of Forestry and Natural Environment Management places emphasis on the basic principles, their applications and the relationships among various forestry and natural environment works topics, thus leading to the overall education of students. Lectures, which deal with the theoretical analysis and synthesis, are complemented with laboratory work in the form of practicals, workshops and/or action practice.

The students' academic progress is assessed by examinations at the end of each 15-week semester. The minimum passing grade is 5 (scale 0 to 10). In the case of subjects consisting of both lectures

and lab work, the final grade is the mean grade of the theoretical and laboratory examinations, on condition that the student passes both.

The assessment of the lab work consists of continuous assessment (classroom performance) plus at least two written tests.

Practical placement is a vital component of the course. Students can start the practical placement after the last semester of studies provided they have successfully passed all specialization subjects. The Department continuously keeps in contact with the Agencies, enterprises and Organizations where the students have been placed.

Students have to submit a project dissertation. They work on their dissertation during the 7th and 8th semester under the supervision of the appropriate academic staff. The students present and defend their dissertation in front of 3 academic member committee, who assesses it on a scale 0 - 10. The passing grade is 5.

After a successful completion of the above requirements, the Department grants the Degree to the student.

THE COURSE

Subject Code	Subjects	Type	ECTS credits	L	P	AP
1st Semester						
FOA101	Mathematics	CS	5	2	-	2
FOA102	Technical Drawing	CS	4	1	3	-
FOA103	Plant Morphology - Physiology	CS	5	2	3	-
FOC205	Remote Sensing	CS	4	2	2	-
FOA104	Computer Applications in Forestry	CS	6	2	3	1
FOA105	Statics	CS	5	2	2	-
	TOTAL		29	11	13	3
2nd Semester						
FOB106	Topography	CS	5	2	2	-
FOB107	Forest Biometrics I	CS	5	2	2	-
FOB108	Forest Botany I	CS	5	2	2	-
FOB201	Wildlife Biology	CS	5	2	2	-
FOB202	Forest Soil Science	CS	5	2	3	-
FOB109	Meteorology - Climatology	CS	5	2	1	-
	TOTAL		30	12	12	
3rd Semester						
FOC110	Forest Botany II	CS	5	2	2	-
FOC203	Forest Biometrics II	CS	5	2	2	-
FOC302	Forest Products Harvesting	CS	5	2	2	-
FOC204	Land Survey	CS	6	2	3	-
FOA301	Forest Protection	CS	5	2	2	1
FOC206	Technical Hydrology	CS	5	2	2	-
	TOTAL		31	12	13	1
4th Semester						
FOD207	Forest Ecology	CS	5	2	2	1
FOD208	GIS-Forest Resource Mapping	CS	5	2	2	-
FOD209	Range Ecology	CS	5	2	2	-
XG-301	Foreign Language - Terminology	CS	5	2	-	2
FOD210	Mountainous Hydrogeomorphology	CS	5	2	3	-
FOD303	Wood Science Technology	CS	5	2	2	-
	TOTAL		30	12	11	3

5th Semester						
FOE401	Forest Management I	CS	6	2	3	1
FOE304	Mountainous Water Control Works	CS	6,5	3	3	-
FOE305	Applied Silviculture	CS	6,5	3	3	-
FOE306	Forest Road Engineering I	CS	6	2	2	-
	Compulsory Option Subject (Attached list)	COS	5	2	2	-
	TOTAL		30	12	13	1
6th Semester						
FOF307	Range Management	CS	5	2	2	-
FOF308	Forest Road Engineering II	CS	5	2	3	1
FOF402	Forest- Environmental Policy & Law	CS	6,5	2	3	1
FOF309	Forest Management II	CS	5	2	3	-
	Compulsory Option Subject (Attached list)	COS	5	2	2	-
	Compulsory Option Subject (Attached list)	COS	5	2	2	-
	TOTAL		31,5	12	15	2
7th Semester						
FOG403	Forest Economics & Appraisal	CS	6,5	2	2	-
FOG310	Forest Fires	CS	5	2	2	-
FOG311	Wildlife Management	CS	5	3	2	-
FOG404	Seminar	CS	7	2	3	-
	Compulsory Option Subject Attached list)	COS	5	2	2	-
	TOTAL		28,5	11	11	
8th Semester						
DIS	Dissertation		20			
PSI	Practical Training		10			
	TOTAL		30			

COMPULSORY OPTION SUBJECTS LIST

WINTER SEMESTER

Subject Code	Subjects	Type	ECTS credits	L	P	AP
FOS312	Geotechnical Engineering	COS	5	2	2	-
FOS313	Natural Environment constructions	COS	5	2	2	-
FOS314	Urban Forestry	COS	5	2	2	-
FOS315	Forest Recreation - Ecotourism	COS	5	2	2	-
FOS316	Protected Natural Areas	COS	5	2	2	-

SPRING SEMESTER

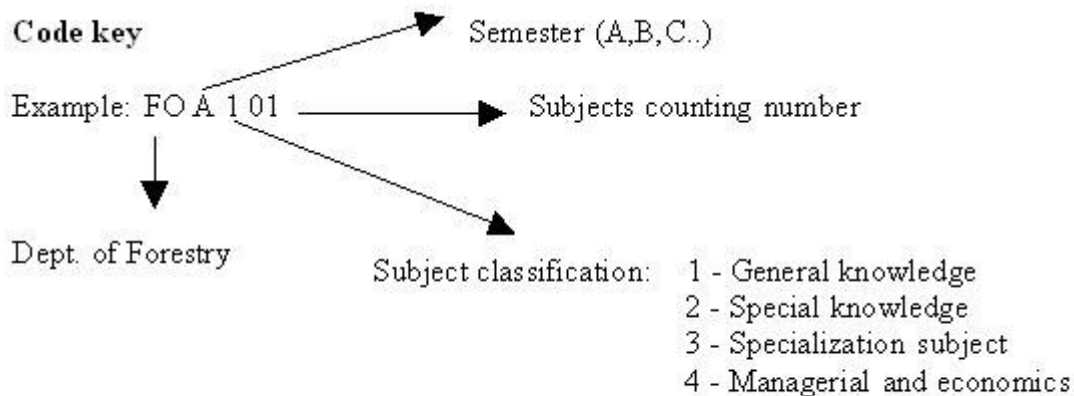
Subject Code	Subjects	Type	ECTS credits	L	P	AP
FOS317	Snow management	COS	5	2	2	-
FOS318	Landscape Architecture	COS	5	2	2	-
FOS319	Environmental	COS	5	2	2	-

	Education					
FOS320	Environmental Impact Assessment	COS	5	2	2	-
FOS321	Structure Elements - Reinforced concrete	COS	5	2	2	-

Grades		
Greek	Definition	ECTS
10 to 8.5	Excellent	A
8.4 to 7	Very good	B
6.9 to 6	Good	C
5.9 to 5.1	Fairly Good	D
5	Pass	E
4.9 to 4	Insufficient	FX
3.9 to 0	Bad	F

Legend

L: Lecture hours per week
 CS: Compulsory Subject
 AP: Action Practice
 COS: Compulsory Option Subject
 P: Practical/Workshop hours per week
 DIS: Dissertation
 PSI: Practical Training
 Prerequisites: See attached course content



COURSE CONTENT

• 1st SEMESTER

FOA101- Mathematics (2L, 2AP)

Vector calculus, vectors, analytical geometry. An introduction to linear algebra (matrices, determinants, eigenvectors and eigenvalues). An introduction to differential calculation (derivatives, study of function). Integral calculus (Integrals, improper integrals). An introduction to differential equations (linear differential equations first order, separable variables).

FOA102- Technical Drawing (1L, 3P)

Drawing instruments and materials, lines, writing, scales, grid drawing. Basic geometric shapes. Scetch, working drawing. Orthogonal projection. Ground drawing with a) rectangular coordinates b)

polar coordinates and c) magnetic azimuths. Dimensions, symbolisms. Longitudinal and cross-section contour drawing. Soil pattern drawing.

FOA103- Plant Morphology and Physiology (2L, 3P)

This course emphasizes basic biochemical, morphological and physiological aspects of plant biology.

A. Plant morphology. Plant cell. Cell types. Tissues. Plant organs: shoot, root, leaf, flower, fruit, sperm.
B. Plant physiology. Water in plants. Plant metabolism. Growth and development.

FOC205- Remote Sensing (2L, 2P)

General concepts. Remote sensing systems. Instruments and material for aerial photography. Photographic system. Airphoto geometry. Airphoto types. Airphoto characteristics. Distortion-displacement. Stereoscapy, stereovision, stereoparallax. Measurements of object heights, slopes, basal areas and timber volumes with airphotos. Photo-interpretation and mapping, elements of photo-interpretation. Thematic mapping. Orthophotos and Orthomaps. Satellites and satellite images. Resolution of satellite data. Radiometric and geometric accommodation. Advantages of satellite data. Digital processing of satellite data. Image enhancement. Classification satellite data. Accuracy. Applications of remote sensing in viewing, managing, protecting and developing natural ecosystems and environment.

FOA105- Statics (2L, 2P)

Forces systems, units, balance. Analysis- synthesis of forces. Diagram of free body. Conditions of equilibrium of forces. Friction. Isostatic bears. Moment of force. Couple of forces, string polygon, joint reaction. Simple triangulated lattice girders. Rectilinear beam, simply supported beam, cantilever beam. Cross-section loads (N, Q, M).

• **2nd SEMESTER**

FOB106- Topography (2L, 2P)

Basic concepts. Land surveying instruments, measurement units. Distance measurements with measuring tape, tachymeter, clinometer, electronic tachymeter. Angle measurement with compass and theodolite. Slopes and applications. Specification of point location on the surface of earth. Elevation. Geometric leveling. Road leveling. Trigonometric leveling. Polygonal traverse.

FOB107- Forest Biometry I (2L, 2P)

Introduction to statistics. Means and methods of data collection, ways of organizing and presenting statistical data, measures of central tendency, measures of dispersion, measures of skewness and kurtosis. Probabilities, discrete probability distributions, continuous probability distributions. Estimation of confidence intervals. Hypothesis testing. Correlation - Regression.

FOB108- Forest Botany I (2L, 2P)

Flora (basic elements) - Flora of Greece (general), Systematic Botany (general). Types of leaves, flowers, fruits. Plant taxonomy (comparative morphology, phylogeny, floral diagrams - floral types). Ecological importance, biotic characteristics and chorological information of plant species. Description keys of plant species. Discrimination between non-vascular/ vascular plants. Important plant species - families of Gymnospermae (indigenous and ornamental Gymnospermae) and significant (from the forestry point of view) Angiospermae (Salicaceae, Juglandaceae, Betulaceae, Fagaceae).

FOB201- Wildlife Biology (2L, 2P)

Characteristics and taxonomy of wildlife species. Ecological concepts, energy flow, food relationships and webs. The value of wildlife. Spatial and temporal variation of biocommunity. Characteristics, availability and management principles of wildlife habitats. Dispersion, dispersal, daily and seasonal movements and migration of wildlife species. Home range size and features. Breeding strategies and reproductive rates. Mortality patterns and causes. Density-dependent and density independent mortality and reproduction. Laboratory exercises in the morphology, systematics, biology and species identification of the main terrestrial vertebrates (mammals, birds, reptiles and amphibians) and freshwater fishes of Greece.

FOB202- Forest Soil Science (2L, 3P)

Soil minerals and rocks and their relationships with forests. Forest soils formation. Soil physical and chemical properties. Soil organisms. Organic matter. Forest humus. Forest soils and hydrological

cycle. Impacts of forest fires and human activities on forest soils. Soils of forest nurseries. Forest soil sampling and analysis. Forest soil classification. Nutrient cycling.

FOB109- Meteorology - Climatology (2L, 1P)

Atmospheric composition. Energy and temperature. Atmospheric moisture. Atmospheric motion. Air masses, fronts and depressions.

Climatic classification. Micro and Macroclimate. Climate and Forest. The climate of Greece.

• **3rd SEMESTER**

FOC110- Forest Botany II (2L, 2P)

Important plant species - families of Angiospermae, Vegetation history (species evolution, endemic species, centers of diversity), Phytogeography (in relation to Vegetation history - chorological types), Vegetation (general) - Vegetation (physiognomy of vegetation, vegetation zones, vegetation units), Threatened - Rare plant species - Legislation status, Ethnobotany (human/natural ecosystems interactions).

FOC203- Forest Biometry II (2L, 2P)

Introductory concepts. Measuring individual trees (diameter measurement, calculation of basal area, length and height measurements, estimation of tree form, bark measurements, estimation of tree volume). Estimation of stacked wood volume. Measuring forest stands (diameter measurements, estimation of stand basal area, estimation of stand heights, estimation of stand form, estimation of stand volume). Estimation of tree and stand age. Growth and increment of individual trees. Growth and increment of stands.

FOC302- Forest Products Harvesting (2L, 2P)

The module describes the necessary works that take place in the forest for the harvesting of the main forest products, namely wood and resin. The main issues which discussed during the semester include: current situation and productivity of Greek forest, Planning and organization of wood harvesting, means of harvesting, harvesting systems, forest accidents and economic issues of forest products harvesting.

FOC204- Land Survey (2L, 3P)

Surveys: Horizontal land survey, mixed or tachymetric land survey, topographic plotting, area calculations, area distribution. Introductory concepts of Cartography. Map classification, map reading, map orientation. Forest cartography in Greece. Maps of Greece. Map plotting, cartographic symbols. Hatt's projection, cross-section Mercator's projection. Masses of earthworks. Marking of rectilinear, angles, horizontal and vertical transition curves.

FOA301- Forest Protection (2L, 1AP, 2P)

Damages caused in forests by

- Climatic factors
- Soil factors
- Environmental pollution.

Damages and diseases caused to forests by biotic agents such as pathogenic microorganisms (viruses, bacteria, fungi), lichens, dicotyledonous parasites, under storey, microsporidia (protozoa), worms, spiders, myriapods, insects (distribution, morphology and ecology of the most important insects of the Greek forest ecosystems and the dry wood-boring insects), snails, birds and mammals. Means of control and treatment of these damage-causing agents.

Reassurance of the forest ecosystem's health.

FOA104- Computer Applications in Forestry (2L, 1AP, 3P)

Introduction to Windows, Introduction to the Internet. Word processing software (WORD), Spreadsheets (EXCEL). Computer aided design (AUTOCAD).

FOC206- Technical Hydrology (2L, 2P)

The goal of this course is to develop an understanding of watershed processes, including precipitation, infiltration, generation of runoff, stream flow, peak discharge, precipitation-runoff models, drought index, quality of surface water, water balance. Environmental change and human impact are emphasized through consideration of watershed management, agriculture, urban development and climate change.

- **4th SEMESTER**

FOD207- Forest Ecology (2L, 1AP, 2P)

Components and functions of forest ecosystems. Forests of the earth. Forests of Greece. Environment and forests. Solar radiation and forests. Water and forests. Atmosphere and forests. Climate-forest relationships. Forest Physiography. Soils and forests. Biotic factors and forests. Fire and forests. Growth ecology. Forest species propagation.

FOD208- GIS-Forest Resource Mapping (2L, 2P)

General concepts (Data, Information, System). Geographical Information Systems (Definitions, Historical evolution). Processing of G.I.S. Advantages and disadvantages of G.I.S. Basic components of G.I.S. (Electronic system, software, data). Data management (models, structure, vector, raster). Organizing database (structure, hierarchical, relational) Data analysis. Classification and mapping natural resources. Digital elevation model. Application of G.I.S. in Forestry and other.

FOD209- Range Ecology (2L, 2P)

Rangeland Ecology purposes and rangeland economic value. Biological cycle, physiology, growth and morphogenesis of rangeland plants. Phenology. Structure, function and productivity of rangelands. Grazing and abiotic environment effects on plants and rangelands. Diachronic changes of rangeland flora and succession. Disturbance and degradation - desertification. Description and identification of the main rangeland species. Plant diversity - indices.

XG-301- Foreign Language - Terminology (2L, 2AP)

Teaching of specific vocabulary through authentic or/and semi-authentic texts and implementation of special lexical items into tasks. Synonyms, antonyms, derivatives, set phrases, collocations, etc. Tasks that aim at enhancing the students' language skills in comprehending and producing written and oral speech (receptive and productive skills): reading comprehension, synthesis and development of a paragraph, summary writing, letter writing, CVs, discussing and describing topics, conveying information, etc.

Reference to certain grammatical and morphosyntactic phenomena: tenses, modals, comparatives, passive syntax, conditionals etc.

Practicing language functions: making hypothesis, narrating a sequence of events/actions, ways of comparing, of expressing reason and result, purpose, method, etc. Translation tasks.

FOD210- Mountainous Hydrogeomorphology (2L, 3P)

The aim of this course is the exploitation of torrents, rivers, morphometric and hydrographic characteristics, the classification of torrential streams. The types of torrential phenomena which are developed and the processes that triggers them are emphasized. The process of soil erosion, degradation, the sediment transport and sediment deposition, the part of forest and vegetation are explored. Additionally it is been analysed the use of Geographical Information Systems to the spatial and quantitative estimation of soil erosion.

FOD303- Wood Science Technology (2L, 2P)

The module describes issues about the wood structure, technology and industrial utilisation. The wood structure is focused on main macroscopic, microscopic and physical characteristics that are necessary for wood identification. Wood technology discusses issues on wood properties, wood drying and preservation. Finally, the technology production, the properties and the applications of the main wood products are covered (sawn wood, veneers, plywood, glulam, particleboard, OSB, fibreboard).

- **5th SEMESTER**

FOE401- Forest Management I (2L, 1AP, 3P)

Basic concepts and operational scope of Natural Terrestrial Ecosystems Management. Functions of management: planning-decision making, organizing, staffing, leading and control. Basic concepts and scientific scope of Natural Terrestrial Ecosystems Management. The tools of Management Science/Operations Research and Natural Terrestrial Ecosystems. Qualitative analysis. Quantitative analysis: Networks (Gantt, PERT/CPM), Linear Programming, Forecasting, Dynamic Programming, Simulation, decision theory. Basic concepts and tools of spatial analysis. Sustained yield concepts, growth, maturity, the regular forest.

FOE304- Mountainous Water Control Works (3L, 3P)

The aim of this course is to develop an understanding of principals and management plans of hydrologic control, protective management, development of an integrated plan of interventions for the control of mountainous surface water, the control of water in order to prevent the creation of flood discharge at urban areas. Emphasis is given to the hydronomic work, categories of check dams, parts of dams, categories of dams, earth dams, other technical works, agro-technical, plant- technical, building material of technical works, acting power of dams, charge, balance, dimensioning of mountainous control works. Specifications and requirements for the elaboration of studies and the construction mountainous water control works.

FOE305- Applied Silviculture (3L, 3P)

Definitions, subject scope and historical evolution of Silviculture. Forest stand development. Structure and regeneration of natural forests. Silvicultural systems. Natural regeneration. Artificial regeneration. Forest cultivation. Elements of applied silviculture.

FOE306- Forest Road Engineering I (2L, 2P)

General concepts. Traffic analysis. Tractive effort and resistances. Visibility. Stopping-sight distance, passing - sight distance. Geometric design. Principles of road alignment. Horizontal alignment. Vertical alignment. Cross-sections, superelevation. Project phases: reconnaissance project, preliminary project, final project. Land registry.

• **6th SEMESTER**

FOF307- Range Management (2L, 2P)

Rangeland inventory. Proper use. Principles of rangeland management (sustainability, productivity, grazing capacity, stocking rate). Arrangement of the stocking rate in space and time. Rangeland improvement (fertilization, digging, seeding, decrease of unpalatable species). Multiple use of rangelands.

FOF308- Forest Road Engineering II (2L, 1AP, 3P)

Estimating earthwork quantities. Distribution, mass-haul diagram. Earthworks machinery. Road drainage. Surface runoff quantities, basic culvert design, drainage ditch design. Pavement design. Flexible pavements, rigid pavements.

FOF402- Forest - Environmental Policy & Law (2L, 1AP, 3P)

Basic concepts and scope of Forest and Environmental Policy. The sustainable development concept. Principles, goals, means and measures of Forest and Environmental Policy in the framework of sustainable development. Forest property, forest taxation, forest cooperatives. Public relations and Forest-Environmental Policy. Rules of law, division of power. Forest and Environmental Laws. European directives and regulations. Environmental Civil Services, penalties and civil responsibility, environmental protection from human activities, construction works and pollution. Nature and landscape protection. Zones for production development and zones for specific environmental support.

FOF309- Forest Management II (2L, 3P)

Basic concepts of sustainable forest management. Spatial analysis, land classification, geographic information systems. Social participation for setting up objectives and developing alternative actions to achieve the objectives. Tools for evaluating impacts of alternative actions in the framework of sustainable development and management. Single objective forest management: Timber scheduling approaches of high forest, coppiced forests and coppiced forests with standards. Yield models, sustained yield calculations. Recreation forests, resin production forests, protected forests and forests lands. Multi-objective forest management: Trade off analysis methods. Forest management plans, content and regulations. Compilation of forest management plans.

• **7th SEMESTER**

FOG403- Forest Economics and Appraisal (2L, 2P)

Basic economic concepts, the tools of economic analysis. Market structure, demand, supply and equilibrium. The price elasticity of demand, Marginal analysis, inputs - outputs, costs and production. Timber prices in a market economy. The forest as capital, interest rates, discounting and compounding payment series. Timber production economics, economic analysis of non-market benefits, forest appraisal, trade, forest industries. Forestry and regional economic analysis.

FOG310- Forest fires (2L, 2P)

The contribution of forest to the protection of the ecological balance of an area and the benefits that derive from its existence. Historical retrospect of forest fires at a Greek, European and international level. Study of the ecological importance of forest fires. Prerequisites for the occurrence of forest fires (combustible forest matter, climatic conditions, landscape of the area). Types of forest fires and causal agents for their occurrence. Study of the distribution and attitude of forest fires. Influence of forest fires into flora, fauna, water balance as well as into the soil protection of the area. Effect of forest fires into environmental pollution and climate change at a local and broader level. Precaution and restraint of forest fires. Maculation effect. Manipulation and law protection of the burnt areas.

FOG311- Wildlife Management (3L, 2P)

History and goals of wildlife management. Decision analysis, feasible options and failures in wildlife management. Methods of estimating population parameters, estimation of abundance, growth rates, reproduction, mortality, dispersion, food habits and genetic structure. Experimental design and sampling techniques.

Characteristics of animal community. Methods of measuring diversity indices and relative abundance of animal community. Conservation of endangered species. Causes of species and population extinction. Minimum viable population size and population viability analysis. Estimation of maximum sustainable yield in game species population. Causes and prevention of damage by vertebrate pest species. Conservation of biodiversity and management of animal community. Criteria for protected areas establishment. Processes of protected areas degradation. Conservation, management, restoration of wildlife habitat within protected areas. Main Greek game species propagation and release techniques.

FOG404- Seminar (2L, 3P)

Teaching literature search and scientific text writing of forestry subject. Specific lectures on subjects of general forestry interest by invited speakers. Writing and presentation of individual and group projects.

• **COMPULSORY OPTION SUBJECTS (WINTER SEMESTER)**

FOS312-Geotechnical Engineering (2L, 2P)

General concepts. Physical properties of soil. Mechanical analysis of soils. Consistency and sensitivity of clays. Soil classification. Hydraulic properties of soils. Effective stress concepts. Mechanical properties of soils. Conditions of failure for soils. Shearing resistance. Compressibility, consolidation. Stresses in a soil mass. Lateral earth pressure and retaining walls. Bearing capacity of shallow foundations and piles. Stability of slopes.

FOS313- Natural Environment constructions (2L, 2P)

Draining of roads. Circular culverts. Bridge culverts. Arch culverts. Retaining wall, fountains, e.t.c. Using vegetation and technical works for protection and improvement of cuts and fills and landscape reclamation. Strength of wooden structures. Appropriate kinds of wood. Wood soaking. Wood structures on roads-pavements-footpaths. Wooden bridges, tables, benches, toys, kiosks, shade-roofs, lodges.

FOS314- Urban Forestry (2L, 2P)

Ecological characteristics of cities. Trees and generally urban greenery effects on the city climate. Species' selection according to ecological, functional and aesthetical criteria. Methods of improving trees' survival in cities. Methods for caring trees, shrubs and vegetation in a city. Management and protection methods of urban greenery (gardens, parks, tree rows, mobile greenery e.t.c.).

FOS315- Forest Recreation - Ecotourism (2L, 2P)

Introduction concepts of forest recreation and forest tourism. Ecotourism-Agrotourism. Natural resource recreation supply. Recreation demand. Forest recreation constructions: Footpaths, picnic sites, sightseeing sites, environmental education constructions. Forest recreation management. Vegetation management of recreation forests.

FOS316- Protected Natural Areas (2L, 2P)

Basic concepts of natural environment and ecosystems. Types of habitats and biodiversity. Human activities and impacts on landscape. Environmental and ethical issues. Sustainable development. Environment as a socio-economic stock. Categories and values of protected areas. Criteria for the design and establishment of protected

areas. Size, shape, connectivity and potential threats to protected areas. National Parks, Aesthetic Forests, Protected Natural Monuments, Wildlife Reserves, Controlled Hunting Areas, Wildlife Propagation Areas, Eco-development Regions, Sites of International Interest, Natura 2000. Administration and management of protected areas. Integrating management plan. Recreation and other activities in protected areas. History of protected areas legislation.

COMPULSORY OPTION SUBJECTS (SPRING SEMESTER)

FOS317- Snow Management (2L, 2P)

Snowfalls, mechanical characteristics of snow. Equilibrium of snow. Methods of snow-cover measurement. Techniques of snow conservation. Ski-centres. Management and feasibility of ski-centres. Principles and techniques of snow and snow-cover control. Avalanches, mechanism and causes of avalanches, protection methods. Snow and winter tourism.

FOS318- Landscape Architecture (2L, 2P)

Introductory concepts of landscape architecture and aesthetic forests. Natural visual resources. Forest vegetation as a landscape element. Natural and man-made landscapes. Fitting of constructions in the natural landscape. Landscape vulnerability. Visual analysis and synthesis of natural landscapes. Impacts on natural landscapes. Improvement of natural landscapes. Management of natural landscapes. Ecological features of urban landscapes. Tree species selection for urban landscapes. Quality improvement of urban landscapes. Alley management. Parks, Gardens, Alleys. Ground vegetation. Mobile green. Visual improvement of aesthetic and degraded forest ecosystems. Aesthetic reforestations. Restoration of disturbed landscapes.

FOS319- Environmental Education (2L, 2P)

Introduction to environmental education. World environmental crisis. History and characteristics of environmental education in Greece and international. Contents, definitions and aims of environmental education. Multiscientific approach to environmental education. Usual issues for environmental education. Methodological approach to environmental education. Characteristics of educational techniques adjusted to environmental education. Planning, development and conduct of environmental games. Assessment and evaluation techniques for environmental programs. Data collection, analysis and interpretation in environmental education program. Implementation and practice of environmental education at different age levels.

FOS320- Environmental Impact Assessment (2L, 2AP)

General concepts, nature of Environmental Impact Assessment, projects and actions submitted to Environmental Impact Assessment, scope of the Environmental Impact Assessment process, stages, organizations and personnel involved in the Environmental Impact process. Identification, scoping and screening, determination of project characteristics and base-line environmental conditions, prediction of environmental impacts, determination of impact significance for decision - making, consultation and public participation. Models and applications of Environmental Impact Studies.

FOS321- Structure Elements - Reinforced concrete (2L, 2P)

Properties of minerals, categories of materials of construction, artificial and natural aggregate materials, cements, plasters, concrete building in normal force, bending moment, shearing force. Anchoring of reinforced bars. Serviceability limit state due to distortions. Reinforcing of structural elements. Calculation and drawing rectangular plates, rectangular sections of rectilinear beams, retaining walls-cantilevers, retaining walls with spurs. Construction details of structure elements. Measurement of quantities of materials.

DISSERTATION

Every student is required to undertake a dissertation on chosen subjects of the Department program study related to real world issues. To carry out their dissertation students use the Department premises and equipment and if necessary Department financial resources. Some students can carry out their dissertation in selected Organizations, Agencies and private enterprises following approval of the Department Council. Students can undertake a dissertation only during the final term of their study after they successfully complete two thirds (2/3) of their study course.

Dissertation fulfilment requirements and other relevant issues are determined by Subject Groups resolutions. Dissertation topics can be also undertaken by groups of students up to three following equal work load allocation to each group member. Subject Groups suggest, approve and announce

lists of dissertation topics every academic year. Students can choose a topic from the suggested lists and apply for approval by filling in a specially designed application form. The relevant to the dissertation topic Subject Group then grants approval and assigns supervision of the dissertation to a permanent or contracted member of staff. The dissertation supervisor attends and guides work progress, while ensuring all that the required facilities are provided to the student to complete his work. Students can extend their dissertation work even beyond the end of the time study in accordance to the extent and context requirements of their work. The duration of dissertation work however cannot exceed three (3) semesters. In opposite cases students should choose a new dissertation topic.

After completing the dissertation work students following their supervisor's approval submit the dissertation in three bound copies to the Department Secretarial Office. The Department council assigns a presentation date not earlier than 10 days after submission at which the student present the dissertation work in a front of three member examination panel of permanent and / or contracted academic staff. Presentation is open to attendance to all members of the academic staff. The examination panel grants by majority vote a grade based on the supervisor's recommendation. In case the dissertation is carried out by a group of students a grade is granted to each one of the students. In case the dissertation work is judged inadequate, corrections are requested and the submission and presentation process is repeated.

PRACTICAL TRAINING

The - on the job - practical training is of six calendar months duration. Practical training is guided, evaluated and carried out in Firms, Agencies, Municipalities and Institutions of related to the Department studies program interests.

The Practical Training Committee

All the related to practical training issues are coordinated by a five member panel consisting of three members of staff and 2 student representatives.

The Practical Training Committee has the following responsibilities:

Practical Training Application

Every student who wants to carry out -on the job- practical training should apply to the Department Secretarial Office for the agency or firm of his interest. The Practical Training Committee allocates the practical training posts on the account of the student's preference recorded in the application forms. Students can also apply for posts other than those selected by the Committee. In this case, the Committee after evaluating the adequacy of the proposed agency or firm may grant permission to the student to choose the post.

Supervision of Practical Training

Students during their practical training are supervised by a practical training supervisor, who is assigned by the Department Council. Members of staff, who have been assigned the task of supervising the practical training visit the relevant working places, obtain information about the students practical training program, monitor the students training performance and support the students to solve problems resulting at the training working place. In case the employment agency or firm diverts from the approved student practical training program, the Practical Training Committee reserves the right to terminate the student's practical training at this particular agency or firm. The Committee then assigns a new training post to the student. At the new post the student completes the remaining practical training time up to the required six- month period.

Trainees rights - duties

All students during their practical training record in detail their every-day activities in the practical training book. The trainees' records are checked and signed by the agency responsible for the students' practical training every week. During the six-month practical training students are allowed to be out of work for a total of 5 working days for serious personal reasons. Absences are recorded in the practical training book and they are reviewed and signed by the student's supervising practical training member of the academic staff.

Students during their practical training should respect all the internal working regulations of the employment agency or firm. Non justified absences or violation of the employment agencies internal working rules lead to termination of the practical training. In this case, students should repeat the search process for a new training post to complete the remaining practical training time in the following semester. Practical training is paid according to the legal regulations. After completing the practical training students submit to the Department Secretary a practical training certification along with their

practical training book, fully completed with the weekly reports, employment time and activities, days out of work and the training performance report.

The Department head or the Practical Training Committee after assessing all the submitted documents decides on the student's practical training acceptance or rejection.