

List of Modules ERASMUS				
Course Code	Title	Content	Learning Outcomes	ECTS
WINTER SEMESTER				
A.Y.2	Ecology	<ul style="list-style-type: none"> • Introduction to ecology and its evolution • Organisms and abiotic environment • Individuals and Populations • Interactions between organisms • Ecosystems and communities • Concept, value and assessment of biodiversity • Special subjects of ecology • Introduction to conservation biology 	Upon completion of the course, students will know: the basic concepts of ecology and its historical development. The effect of abiotic factors on organisms. The concept and the dynamics of populations in ecosystems. Interactions, interdependence and competition between organisms. Ecosystems, communities, meta-populations. The concept and levels of biodiversity and ways of direct and indirect assessment.	6
C.Y.4	Evaluation and assessment of ecosystem services	<p>Basic concepts of ecosystem services evaluation. Nature and role of ecosystem services in human well- being and sustainable development. Ecosystem classification systems. Assessment through the ecosystem services suitability approach. Suitability mapping of ecosystem services. Assessment through the total economic value approach, direct values, indirect values, option values, bequest values, existence values, intrinsic values. Economic valuation tools, quantitative value method, benefit transfer method, damage cost avoided, replacement cost and substitute cost methods, market price method, productivity method, willingness to pay methods (Travel Cost, Contingent Valuation, Choice Modelling). Scenario analysis. Case studies.</p> <p>Keywords Environmental Economics, valuation of non-market goods / services</p>	<p>It is now widely accepted that Ecosystem Services are particularly important for human well-being and therefore natural resource design and management analysis should ensure that these services are provided when sustainable development is pursued. However, their evaluation and economic assessment process involves significant challenges as these services are not marketed and therefore it requires different tools and approaches.</p> <p>Upon successful completion of the course, students are expected to:</p> <ul style="list-style-type: none"> - understand the nature and role of ecosystem services for sustainable development - become acquainted with the classification systems of ecosystem services - become acquainted with the approaches and tools for evaluating and assessing ecosystem services - be able to use theoretical and practical knowledge to conduct studies and research on the evaluation and economic assessment of ecosystem services. 	5
C.Y.6	Forest and Environmental Statistics	Introduction to basic statistics: Concepts and terminology (population, sample, variables, parameters). Forest and Environmental data acquisition (sample size determination and sampling methods). Descriptive statistics (frequency, histograms, measures of central tendency, dispersion measures, coefficient of variation). Probability theory and statistics (sample space, probability distribution, sampling error). Hypothesis testing (mean values, Chi-Square goodness of fit). Correlation. Analysis of Variance. Regression. Introduction to R (CRAN) statistical software. Keywords Statistical Analysis, sampling, statistical significance, statistical error, statistical assumptions	Upon successful completion of the course, students will be able to design a statistical survey based on sampling principles, analyze data or databases by organizing, presenting and describing the results obtained from the research process (descriptive statistics). At the same time, they will be able to draw useful conclusions and forecasts for the population through the sample under consideration (inductive statistics). Within the course, it will be possible to correlate, analyze variance and create statistical models for predicting key variables with regression techniques.	5
E.Y.1	Geographic Information Systems	<ul style="list-style-type: none"> • The Concept and historical evolution of Geographic Information Systems • Geographic data formats - properties, advantages, disadvantages. • Generate geographic data and search sources • Coordinate systems, projection systems and georeferencing • Descriptive information, tables, queries. • Geographical data analysis and information generation • Geo-databases • Data visualization and production of cartographic backgrounds. • Introduction to spatial analysis • Introduction to spatial interpolation methods 	Geographic Information Systems (GIS) are a modern and essential tool in the analysis and management of the environment, while the methods applied in GIS are constantly evolving. The course aims to give the student the necessary theoretical and technical knowledge so that he/she can create and analyze a GIS. Upon completion of the course the student: will know what a GIS is and will be able to create and find data. He/she will know methods of analyzing geographical data, transforming and modifying data in order to produce useful information from them. He/she will know the differences, advantages and disadvantages of different forms of geographic data. He/she will be able to create a geo-database. He/she will know what coordinate systems are and how to choose the right one in each case. Finally he/she will be able to visualize geographical data and produce cartographic backgrounds.	4
G.Y.1	Forest Fires	Forest fires in Greece and abroad, forest fire behavior, ecology of fire, climate change and forest fires, causes, legislation, environmental impacts, fire forecasting, prevention and suppression of forest fires.	Upon successful completion of the course, students are expected to be able to understand and manage forest fires.	6

C.Y.1	Watershed Management	<p>Hydrological processes implemented at watershed level including precipitation, infiltration, surface runoff, drought indices, water quality and water balance. Delineating the boundaries of the watershed area. Emphasis is placed on being aware of the impact of changing environmental factors and anthropogenic effects on river watershed management, urban development and climate change.</p> <p>Keywords: Watershed, Hydrological Cycle, Surface Water, Technical Hydrology, Water Management</p>	<p>The course teaches the basic methods for the proper management of surface waters in Greece. The aim of the course is to understand the hydrological processes and to learn the basic concepts on surface waters, the hydrological cycle and their proper management at the watershed scale. Upon successful completion of the course the student will be able to:</p> <ul style="list-style-type: none"> • Understand the hydrological cycle • Manage sustainable surface water • Recognize the boundaries of watersheds and understand their importance • Manage sustainably river and torrent watersheds 	5
SPRING SEMESTER				
B.Y.1	Wildlife Biology	<p>Elements of zoology. Vertebrate systematics and taxonomy. Mammal anatomy and biology. Description, ecology, biology, behavior, reproduction, habitats, populations and distribution, food habits of the mammals of Greece. Bird anatomy and biology. Description, ecology, biology, behavior, reproduction, habitats, populations and distribution, food habits of the birds of Greece. Amphibian anatomy and biology. Description, ecology, biology, behavior, reproduction, habitats, populations and distribution, food habits of the amphibians of Greece. Reptile anatomy and biology. Description, ecology, biology, behavior, reproduction, habitats, populations and distribution, food habits of the reptiles of Greece.</p>	<p>Upon successful completion of the course, students should be able to design and apply studies and to evaluate and analyse wildlife biology related issues. In particular, they will have to:</p> <p>a) Be in a position to identify Greek wildlife species and acquired a basic knowledge of their biology and spatiotemporal distribution.</p> <p>b) Know how to prepare synthetic studies that comprehensively analyse the several aspects of a wildlife biology related issue, concerning the population dynamics, breeding biology, behavioural biology, feeding biology, etc. of wildlife species, taking into account the various environmental, ecological and anthropogenic factors possibly affecting them.</p> <p>c) Be capable of reviewing relevant Greek and international scientific literature, so to formulate informed views and judgements on wildlife biology related issues.</p> <p>d) Know how to communicate information, ideas, issues and answers to both expert and nonexpert audience.</p> <p>e) Have developed the knowledge acquisition skills necessary for further studies.</p>	5
D.Y.6	Wood Technology & Biocomposites	<p>Macroscopic characteristics and identification of softwoods and hardwoods. Microscopic structure, chemical composition and wood infrastructure. Mechanism of wood formation. Variation and abnormalities of wood structure. Density, hygroscopicity, shrinkage and swelling of wood. Mechanical, thermal, electrical and acoustic properties. Natural durability of wood. Production technology (raw material, machines, processing, technological conditions) of wood products (poles, stakes, saw wood, parquets, veneers, plywood, laminated wood, particle board, fibre board, other composite products, wood-plastic composites-WPC). Properties and uses of wood products.</p> <p>Keywords</p> <p>Wood identification, wood structure, wood technology, wood products, properties and uses of wood products.</p>	<p>The students learn how to identify wood species based on their macroscopic and microscopic characteristics and they learn about the physical, mechanical and chemical properties of wood and the variability and differences among different species. They can recognize wood defects on standing trees and grade wood assortments. Finally, they can choose the correct species for further usage according to its properties. The students learn about the technology production of wood products (poles, stakes, saw wood, parquets, veneers, plywood, laminated wood, particle board, fibre board, OSB, LVL, PSL, LSL, I-beam and wood-plastic composite products-WPC). Finally, they can choose the appropriate products for further usage according to its properties</p>	4
F.Y.5	Environmental remote sensing	<ul style="list-style-type: none"> • Historical development of remote sensing • Electromagnetic spectrum and its characteristics • Spectral signature and behavior of geographical objects in the electromagnetic spectrum. • Separating characteristics of satellite images (spatial, spectral, radiometric and temporal resolution) • Satellite systems and possibilities for obtaining data from the internet • Spectral and spatial image enhancement (image registration, geometric correction, atmospheric correction, filters) • Spectral channels and spectral horses (vegetation indices, humidity indices, etc.) • Satellite image classification - objectives, technical approaches. • Pixel-based satellite image classification, supervised and unsupervised. • Object-oriented satellite image classification 	<p>Upon successful completion of the course, students will know: The principles of satellite remote sensing and its applications in the management and protection of the environment. The distinguishing features of satellite imagery as well as ways of obtaining satellite data from various sources. They will also know the basic steps required before the final analysis and processing of satellite images such as error correction techniques, spatial and spectral improvement techniques and spectral index extraction. They will be able to apply basic and advanced satellite image analysis techniques with the appropriate software. Finally they will be able to generate thematic maps using the results of their analysis.</p>	5

D.Y.3	Forest and Natural Environment Sciences	<p>Vegetation and vegetation zones in Greece. More important genera of forest species (woody or shrubby species) and species found in Greece (Gymnosperms - Angiosperms). Morphological features, ecological requirements, geographical distribution and conservation status of the main forest species of the Greek flora.</p> <p>Keywords Vegetation, classification-identification, nomenclature</p>	<p>Upon successful completion of the course, students will learn about the following:</p> <ul style="list-style-type: none"> • Vegetation of Greece. • Morphological features and taxonomic identification of trees and shrubs in Greece. • Ecological characteristics of trees and shrubs in Greece. • Main Habitat Types and the tree and shrub species that can be found in these. Conservation status of the main Habitat Types occurring in Greece. <p>In the workshop, students will gain knowledge and will be able to identify the main woody species (shrubs - trees) found in Greece.</p>	5
OPT.15	Snow Management	<p>Process of snowfall, hail. Mechanical properties of snow, chemical properties of snow, endogenous and extrinsic forces. Methods for measuring snow cover. Snow conservation techniques. Ski resorts. Snow access techniques. Economic exploitation and sustainability of snow. Construction and maintenance techniques, snow and snow cover control principles and systems. Avalanches, mechanism and causes of creation, mode of protection, snow and winter tourism. Snow management and water production.</p> <p>Keywords : Snow and Properties, Snow Management, Avalanches and Protection, Snow Management and Water Production</p>	<p>The course teaches the basic methods for sustainable snow management in Greece. The purpose of the course is to teach the basic knowledge about snow, its creation and properties, its proper management and its hazard management.</p> <p>Upon successful completion of the course the student will be able to:</p> <ul style="list-style-type: none"> • Recognize the different types of snow, their properties • Recognize the different types of snowstorms, their properties • Manage snow hazards • Manage snow to increase water production 	3
OPT.31	Protecting Sensitive Ecosystems from Climate Change	<p>Overall, about climate change, possible impacts of climate change on natural ecosystems, which natural ecosystems are most vulnerable to climate change, analysis of the characteristics of sensitive ecosystems, what are the most sensitive and how we will identify the possible impacts and how-to protect these sensitive ecosystems from the effects of climate change</p> <p>Keywords : Climate change, Sensitive ecosystems, Characteristics of sensitive ecosystems, Ways of protection</p>	<p>The course teaches the main ecosystems that are most sensitive to the impacts of climate change and their protection methods.</p> <p>Upon successful completion of the course the student is:</p> <ul style="list-style-type: none"> • Aware of the potential impacts of climate change on a natural ecosystem • Which ecosystems are most susceptible to changes due to climate change • Propose ways to protect these sensitive ecosystems 	3
B.Y.5	Forest Products Harvesting and Biomass	<p>Main objectives of the Forest Products Harvesting and biomass module (primary exploitation). Main forest products (wood, bark, resin). Secondary forest products (leaves, extracts, fruits, shrubs). Analysis of harvesting systems (aim, forest harvesting environment, economic, social and operational aspects of harvesting). Preparation of harvesting (forest management plan, annual yield, deviations). Elements of ergonomics – Forest work (forest workers’ needs, work performance, training, measures to reduce accidents, securing the working conditions). Forest product harvesting machinery. Harvesting operations and techniques (tree feeling, moving, shaping). Organizing the wood harvesting (silvicultural requirements, economic efficiency, impact alleviation, tree attributes). Non-wood Forest Products harvesting (resin).</p> <p>Keywords Wood and Non-Wood Forest Products, forest workers safety, primary exploitation, logging, forest products exploitation</p>	<p>Upon successful completion of the course, students will acquire applied knowledge of maximizing the use value of forest products, while reducing at the same time the cost of production and the environmental impact of the tree harvesting on the forest ecosystem in the broader context of the used systems development from an economic, social and material point of view. Students are expected to become aware of the forestry work conditions in the Greek Forestry Sector and be able to select the most appropriate equipment, in order to increase the safety of staff during the implementation of forest works. At the same time, basic knowledge will be provided to ensure a uniform and efficient system for the exploitation of forest products.</p>	5