ANEXO I

Escuela Técnica Superior de Ingeniería

GENERAL SPECIFICATIONS

COURSE 25/26

Subject Data				
Name:				
Forest ecology / Ecología Forestal				
English name:				
Forest ecology				
Code:		**Type:**		
606510205		Compulsory		
Hours:				
	Total	**In class**	**Out class**	
Time distribution	150	60	90	
ECTS:				
Standard group	**Small groups**			
	Classroom	**Lab**	**Practices**	**Computer classroom**
3.5		2	0.5	
Departments:		**Knowledge areas:**		
Agroforestry Sciences		Environmental technologies		
Year:		**Semester**		
2°		1°		

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TEACHING STAFF

Name:	E-mail:	Telephone
Raul Tapias	rtapias@uhu.es	959217564

Others Data (Tutoring, schedule...)

Monday 12:00 - 14:00 (Mixta). Office. STPB35 Campus de La Rábida

Link https://uhu.zoom.us/j/92711614284?pwd=em04Rm9CV3NHTTNKLytxRGZkZlhvQT09

Wednesday 10:30 - 14:30 (Mixta). Office 373. Escuela Técnica Superior de Ingeniería - Campus universitario " El Carmen "
Link https://uhu.zoom.us/j/92711614284?pwd=em04Rm9CV3NHTTNKLytxRGZkZlhvQT09

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SPECIFIC INFORMATION OF THE COURSE

1. Contents description:

1.1 In English:

Ecology. Forest ecology: Edaphic, climatic, biotic and dynamic evaluation of forest station

1.2 In Spanish:

Ecología. Ecología de las masas forestales. Evaluación edáfica, climática, biótica y dinámica de la estación forestal.

2. Background:

2.1 Situation within the Degree:

The course requires knowledge of anatomy and plant physiology, soil science and climatology (Earth Sciences) and statistics. Their contributions are essential to the subjects of silviculture and reforestation, Mediterranean silviculture and forest geobotany.

2.2 Recommendations

There are no specific prerequisites, but it is highly recommended that students have a background in technical or science subjects at pre-university level, as well as in subjects of anatomy and physiology and Earth Sciences

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3. Objectives (as result of teaching):
The main objective is to provide students with the knowledge and skills to understand the functioning and structure of forest ecosystems. To be able to study, describe, assess their production capacity and the impact of interventions on them. The specific objectives are: Part I: BASIC ECOLOGY – To expose the most significant theory and models in Forest Ecology. – To analyze and discuss the main biotic and abiotic elements in forest ecosystem. – To describe the relationships between the different components of the ecosystem. – To expose models of analysis of forest ecosystems for their diagnosis, conservation and exploitation. This will be done at three levels: populations, communities and ecosystems. Part II: APPLIED ECOLOGY - To offer different methods to assess the quality of the forest site. COMMON – To know the order of magnitude of the main variables used in forest ecology. - To identify the main authors on forest ecology and on the environment and recognize their contributions. OBJECTIVES OF AFFECTIVE ORIENTATION (VALUES AND ATTITUDES) • To encourage maximum respect towards the forest environment, including rural populations. • To promote the student's appreciation of the forestry profession in its scientific and technical aspects. OBJECTIVES OF PRACTICE GUIDANCE (SKILLS, ABILITIES AND PROCEDURES): • To properly handle the terminology of each discipline. • To develop conceptual and technical skills that enable the acquisition and analysis of information from the forest environment (in the field, laboratory and nursery) and indirect sources (bibliography, Internet). To develop conceptual and technical skills that enable the student to face and solve possible problems of their profession.

4. Skills to be acquired
4.1 Specific Skills:
C04: Forest ecology
4.2 General, Basic or Transversal Skills:
CB1: That the students have demonstrated to possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects which imply knowledge coming from the forefront of their field of study CB3: That students have the ability to gather and interpret relevant data (normally within their area of study) to make judgments that include a reflection on relevant issues of social, scientific or ethical nature CB4: That students can transmit information, ideas, problems and solutions to a specialized and non-specialized public CB5: That the students have developed the necessary learning skills to undertake subsequent studies with a high degree of autonomy G16: Sensitivity for environmental issues T01: Use and mastery of a second language. T02: Knowledge and improvement in the field of ICT

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5. Training Activities and Teaching Methods

5.1 Training Activities:

Theory clases on the contents of the Program.
Problem Solving sessions.
Practical sessions in specialized laboratories or computer rooms.
Field sessions to approach the industrial reality.

Activities Academically Directed by the Faculty: seminars, conferences, development of works, debates, collective tutorials, evaluation activities and self-evaluation

5.2 Teaching Methods::

Theory classes
Practical lessons in the laboratory
Work in groups
Practical work
Field training

5.3 Development and Justification:

Theory classes
There will be 35 hours of lessons in which the theoretical base of the subject will be explained, with the aid of board work and computer presentations. Participation of the students is highly encouraged and will form part of the evaluation
2. Practical lessons in the laboratory
There will be 10 two-hour sessions in the laboratory. These practical lessons will consist in solving practical tasks.
3. Work in groups
There will be two tasks for students to carry out in small groups:
- Practical work
For the practical section of this course, the students will be required to characterize the climate, soil and vegetation of a specific area based on different information that they have gathered and managed. The teacher will provide a list of areas from which to choose at the beginning of the course.
4. Field training
There will be a field trip (1 day) in the province of Huelva in which a soil sampling and vegetation monitoring procedure will be followed

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6. Detailed Contents
THEORY Part I. BASIC FOREST ECOLOGY. UNIT 1: GENERAL CONCEPTS OF ECOLOGY. Definition and division of Ecology. Populations, communities and ecosystems. Forest ecology Ecological factors: Definition and modes of action, Classification of ecological factors. Limiting factors, Law of tolerance and Law of the minimum. Ecological factors and forest management. UNIT 2: AUTOECOLOGY I: CLIMATIC FACTORS. Radiation Temperature. Light. Precipitation. Wind. Joint action of climatic factors in vegetation. Development of climate indexes. UNIT 3: AUTOECOLOGY II: Edaphic AND PHYIOGRAPHIC FACTORS. Edaphic properties that most influence vegetation and its evaluation. Classification of plant species in relation to soil properties. Joint action of edaphic factors in vegetation. Influence of physiography on vegetation: orography, altitude, slope, orientation. Development of edaphic and physiographic indexes. UNIT 4: AUTOECOLOGY III: BIOLOGICAL FACTORS. Intraspecific coactions. Interspecific coactions. Competition between plant populations. Symbiosis of vegetables with fungi and microorganisms. Parasitism on fungal plants and microorganisms. Interspecific coercions of animals on vegetables. Anthropic influences. UNIT 5: POPULATIONS DYNAMICS. Patterns of spatial distribution. Density. Sampling techniques Temporal evolution of the populations. Modalities of growth. Fluctuations Dynamics of forest populations: regeneration, growth, mortality. UNIT 6. POPULATIONS GENETICS. Life histories of the species, variability and its causes, frequencies of alleles and genotypes. Hardy-Weinberg Law. Endogamy vs. exogamy. Genetic drift. Species and Speciation. Quantification of the variation of gene frequencies. UNIT 7: COMMUNITIES. Definitions and components of the communities. Spatial distribution of the species. Species richness and diversity. Index. Dynamics of forest communities. the plant succession, climax. concept and criticism, human interventions in plant succession. Physiognomy and classification. of forest communities UNIT 8: FOREST ECOSYSTEMS. Concepts Structure and operation. Energy flow: the trophic chain. Matter flows. Water cycle. Carbon cycle. Nutrient cycle The biogeochemical cycle in forest ecosystems. Temporal variation Effect of silvicultural interventions on the functioning of forest ecosystems. UNIT 9: DISTURBANCES. Disturbances in the dynamics of forest ecosystems. Effect of disturbances. Magnitude of the disturbing agent. Susceptibility of the ecosystem. Classification of disturbances. The disturbance regime. Abiotic disturbances. Biotic disturbances. Response of ecosystems to disturbances. Application to forest management. Part II: APPLIED FOREST ECOLOGY UNIT 10: EVALUATION OF THE QUALITY OF THE FOREST SITE. Forest Productivity, Concept and Indexes. Methodologies for assessing the quality of the forest site. Dendrometric methods for estimating the quality of the forest site. Methods based on the leaf area index. Methods based on the height of the trees. Methods based on diameter, basal area or percentage of sapwood. Methods based on vegetation. Types of Cajander site. Indicator species. Methods based on ecological factors. Climatic index based on topography and soil. Productivity maps. Multifactor methods. Territorial classifications.

7. Bibliography
7.1 Basic Bibliography:

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Barnes, B.V., Zak, D.R., Denton, S.R. y Spurr, S.H. 1998. Forest ecology. 4th ed. John Willey & Sons, Inc. USA. 774 pp. Se puede consultar una traducción de la primera edición:
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Brower, J.E.; Zar, J.H.; Von Ende, C.N. 1998. Field and laboratory methods for general ecology. Mc Graw-Hill. USA.
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Lambers H, Chapin III FS,. Pons TL. 2008 Plant physiological ecology.: Springer. New York
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Samo Lumbreras, A. . Garmendia A, Delgado JA. 2008. Introducción práctica a la ecología.: Pearson Educación, Madrid
Schneider, David C. 2009 Quantitative ecology [Recurso electrónico] : measurement, models and scaling. Amsterdam ; Boston : Academic Press/Elsevier,
Smith, T. y Smith R. 2007. Ecología, Pearson Education. Madrid. Spurr, S.H. y Barnes, B.V. 1980. Ecología forestal. AGT editor, S.A. Méjico.
Suzuki D, Vanderlinden.K.. Ecología divertida: juegos y experimentos por un planeta más verde. Oniro. Barcelona :,
Terradas, J 2001. Ecología de la vegetación : de la ecofisiología de las plantas a la dinámica de comunidades y paisajes. Omega. Barcelona.
UNED, 2009 Ecología II : Comunidades y ecosistemas. UNED, Madrid
van der Maarel E. (ed) 2005. Vegetation ecology.: Blackwell. Malden, MA

7.2 Additional Bibliography:

Baskin, C C Baskin JM (eds) 2001. Ecology, biogeography, and evolution of dormancy and germination: Academic Press, San Diego
Desharnais. RA (ed) 2005. Population dynamics and laboratory ecology: Elsevier. Amsterdam
Eugène A. 2002 Ecología de las aguas corrientes. Acribia. Zaragoza Farina. A. 2005. Principles and methods in landscape ecology : toward a science of landscape: Springer. Dordrecht
Frelich, Lee E. 2002. Forest dynamics and disturbance regimes : studies from temperate evergreen-deciduous forests.: Cambridge University Press, Cambridge.
Hanski I,. Gaggiotti. OE. (Ed) 2004. Ecology, genetics and evolution of metapopulations. Elsevier Academic Press. Amsterdam
Johnson, P S.. Shifley SR. Rogers ,R.2002. The Ecology and silviculture of oaks: CABI Publishing.
Wallingford Jong TJ. Klinkhamer PGL 2005. Evolutionary ecology of plant reproductive strategies.: Cambridge University Press, Cambridge
Maestre F, Escudero A, Bonet A. (editores). 2008. Introducción al análisis espacial de datos en ecología y ciencias ambientales : métodos y aplicaciones Madrid : Universidad Rey Juan Carlos
Dykinson,. Newton, A C. 2007 Forest ecology and conservation : a handbook of techniques: Oxford University Press,. Oxford
Paracuellos M (editor). 2003. Ecología, manejo y conservación de los humedales.: Instituto de Estudios Almerienses, Almería Valladares F. (editor). 2004 Ecología del bosque mediterráneo en un mundo cambiante: Organismo Autónomo Parques Nacionales, Madrid
Whalen JK, Sampedro. L. 2009. Soil ecology and management: CABI. Cambridge, MA

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8. Systems and Assessment Criteria

8.1 System for Assessment:

Theory and practical written assessment
Bibliographic and field trial work
Practical work
Participation and interest

8.2 Assessment Criteria and Marks:

8.2.1 Examinations Convocatory I

Theory and practical written assessment
This exam represents 70% of the final mark. To pass the subject it is necessary to obtain at least 5 out of 10 in this exam.
Field trial Work
The mark is from 0 to 10 and to pass the subject it is necessary to obtain at least 4 points. The evaluation of this task takes into account the quality of the written work.
Practical work
The mark for this work represents 15% of the final mark. The mark is from 0 to 10 and to pass the subject it is necessary to obtain at least 4 points
Participation and interest
The active participation and interest in the subject demonstrated by students will be evaluated, adding up to 2 point to the final mark.
Final mark
The final mark for the subject will be obtained thus: 0,7 x A + 0,15 x B + 0.10 x C + 0.05 x D

where A is the mark for the theory-practical written exam. B is the mark for the Field trial task. C: is the mark for the practical work. D: Participation and interest
To pass the subject, students have to obtain at least 5 points in the final mark, with at least 4 points in the grades for B and C and a “pass” in the practical activities.
Final results will be given in terms of a numerical scale between 0 and 10 (including tenths), with the corresponding qualitative ratings below:
≤4.9: Fail (D)
5.0 -6.9: Pass (C)
•7.0 -8.9: Pass with Merit (B)
•9.0 -10: Distinction (A)

8.2.2 Examinations Convocatory II

The same as Convocatory I

8.2.3 Examinations Convocatory III

The same as Convocatory I

8.2.4 Extraordinary Convocatory
The same as Convocatory I

8.3 Single Final Evaluation:
In accordance with the Evaluation Regulations for Official Bachelor's and Master's Degrees of the University of Huelva. Approved by the Governing Council on March 13, 2019), with the regulatory notice, any student can request a single evaluation without justification (Article 6.2). This will consist of a written exam of all the content of theory (35%), practices (35%) academic activities (ecological study, 15%) and experimental work related to the field trip (15%).