ESCUELA TÉCNICA SUPERIOR DE INGENIEROS AGRÓNOMOS
UNIVERSIDAD POLITÉCNICA DE VALENCIA

FICHA MEMORIA DOCENTE

Curso Académico 2006/07

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CODE	3928	COURSE NAME/TITLE	SILVICULTURE						
DEGREE	INGENIERO DE MONTES					TYPE	Troncal		
ORIENTATION									
ESTUDIES PROGRAM	1999	CYCLE	1	COURSE	3	SEMESTER	6	FOUR-MONTH PERIOD	B

DEPARTMENT [1]	PRODUCCIÓN VEGETAL
AREA [1]	
COURSE COORDINATOR [1]	EDUARDO ROJAS BRIALES
TEACHING STAFF	EDUARDO ROJAS BRIALES MIQUEL FABRA CRESPO

[1] En el caso de haber **más de un departamento ó área** que imparta docencia en la asignatura, rellenar **una ficha para cada uno de ellos y una conjuntamente firmada por los responsables y directores de todos ellos**.

TOTAL CREDITS:	4.5			
TOTAL THEORY	3.75	TOTAL PRACTICE	3.75	
T. AULA (TA) CLASSROOM	2.25	P. AULA (PA) CLASSROOM	0.80	
T. SEMINARIO(TS) SEMINAR	1.50	P. INFORMATICA [3] (PI) LABORATORY	COLLEGE	DEPT.
T. TUTORIZADA[2] (TT) TUTORIALS		P.LABORATORIO LABORATORY PRACTICE		
		P. CAMPO FIELD WORK	2.95	
		P. TUTORIZADA [2] (PT) TUTORIALS		

[2] Únicamente en el caso de asignaturas con actividades programa de innovación educativa y convergencia europea (PAEEES)
[3] Especificar si los créditos se imparte en aulas de la Escuela o del Departamento

Valencia, a 4 de abril de 2006

Firmas del profesor/es responsable y del Director/es del Departamento

«ASI» «NOMASI» «DEP»/ «v_dptos» «v_areas»

COURSE TITLE: SILVICULTURE

OBJECTIVES

The aim of this subject is to provide the skills for the management of forests at stand level. Silviculture requieres previous knowledges in forest ecology (soil, climate, vegetation) and inventory and is strongly related to forest utilization, forest protection and forest management. Increasing demands of society towards forestry and different natural conditions have to be taken into accunt in the different silvicultural options.

The aim of this subject is to provide the skills for the management of forests at stand level. Natural regeneration, afforestation and silvicultural treatments of forest stands as well as applied knowledge about the leading forest species conform the basic elements of silviculture. Silviculture requieres previous knowledges in forest ecology (soil, climate, vegetation) and inventory and is strongly related to forest utilization, forest protection and forest management. Increasing demands of society towards forestry and different natural conditions have to be taken into accunt in the different silvicultural options.

EVALUATION

Continuous evaluation will be applied based on following elements:
a) active participation during classes and field trips (25%)
b) Labor practica and field trips (25%)
c) Tests and oral final exam (50%)

Continous evaluation will be inforced through tests (at least 4) and oral final exam.
Tests will combine multiple choice questionaire with some some more complex aspects to be developed.
The whole program, both theoretical as practica and field trips will be checked in the exam.

COURSE TITLE: SILVICULTURE

CONTENTS: THEORY

1 INTRODUCTION AND ECOLOGICAL BASES OF SILVICULTURE
1.1 Definitions, objetives, importance and positiion in the forest sciences, basic elements of silviculture and basic sciences
1.2 History of silviculture
1.3 Forest sustainability and Silviculture
1.4 Forest ressources in Europa and its socioeconomic frame
1.5 Silviculture in the forest legislation
1.6 Forest organizations

2 Forest Ecology and Silviculture
2.1 Glatiations and temperate forests
2.2 Forest dynamics and evolution
2.1 Determining ecological factors of silviculture (site: orography, climate, soil, fito-sociology, etc.)

II SILVICULTURAL CHARACTERISTICS OF FOREST SPECIES
3 The main forest species and their silvicultural implications focusing mainly on mediterranean, temperate, boreal and subtropical species
3.1 Conifers
3.2 Broadleaves
3.3 Palm trees

III SILVICULTURAL TREATMENTS
4 General characteristics
4.1 Characteristics of single and stand tree (morphology, light behaviour, sociological class)
4.2 Vertical structures (regeneration method, stratified stands)
4.3 Horizontal structures (even and unevenaged stands, mixed stands)
4.4 Temporary structures (conversions and transformations)
4.5 Forests with specific silvicultural treatments (cork oak, resin pine, agro-forestry)
4,6 Forest growth and yield (dasonomy): age classes, aging and rotation, density, future trees, forest growth dynamics, yield tables, modelization

5 Afforestation, forestation and regeneration
5.1 Afforestation and forestation (methods, techniques, species, improvement and soil treatment, planing, etc.)
5.2 Regeneration by planting
5.3 Regeneration by seeding
5.4 Natural regeneration
5.5 Mixed regeneration

6 Silvicultural treatments in evenaged forests
6.1 Precommercial thinings

6.2 Thinnings and pruning
6.3 Types of thinings (systematic, low, high, mixted, selective, etc.)
6.4 Thining intensity
6.5 Other intermediate treatments (introduction of new strata, diversification, etc.)
6.6 Transformation into evenaged forest

7 Regeneration procedures in evenaged forests
7.1 Clear fellings
7.2 Strip clear fellings
7.3 Shelterwood strip system
7.4 Shelterwood uniform system
7.5 Shelterwood group system
7.6 Shelterwood wedge system
7.7 Shelterwood mixed systems

8 Unevenaged forests
8.1 Tree specific unevenaged
8.2 Grup unevenaged
8.3 Silvicultural treatments
8.4 Regeneration
8.5 Intensity and frecuency
8.6 Transformation into unevenaged

9 Coppice system

10 Coppice with standards

11 Transforming degradated forests
11.1 Transforming coppices in high forests (balibage)
11.2 Regeneration of dehesas and montados (agro-forest systems)
11.3 Old resined pine stands
11.4 Regeneration of negatived selected stands
11.5 Regeneration of burned forests

12 Specific silvicultural treatments
12.1 Cork forests
12.2 Truffel forests
12.3 Pine nut forests
12.4 Management of dehesas and montados (agroforest systems)
12.5 Other agroforest systems
12.6 Forest plantations
12.7 Reserve trees
12.8 Mixed forests
12.9 Silvicultural implications of multifunctional forestry (soil, water, landscape, biodiversity, etc.).

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IV COMPLEMENTARY QUESTIONS

13 The interphase silviuclture-forest utilization

13.1 Planing of utilization and access

13.2 Silviculture and wood/cork quality

14 Silviculture of the Tropics and Subtropics
(tropical rain forests, tropical semirain forests, savanna, semiarid subtropical forests, magroves, fog forests, mountain forests, etc.)

15 Sustainable forest management: criteria and indicators

16 Trends in the future of silviculture (Pro-Silva, autopoiesi, biological automatization, etc.)

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CONTENTS: PRACTICE

The prcatical part of the subject will be mainly provided in the form of field trips. Following 2,5 hours of weekly classes, 1 hour will be alternatively devoted to practical casses and presentation by the students in the form of a semminar.
4 dayly excursions and a longer 2-3 days excursion will be offered. Practical experience in marking and executing precommercial thinings, normal thinnings and sprout selection, as well as marking unevenaged treatments will be included. The excursions shall be organized together with other related forest subjects (range land, nature protection, forest utilization, forest mensuration, forest fires, etc.).

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RECOMMENDED BIBLIOGRAPHY

Álvarez, S. et al. (1968): Frutos secos: Ministerio de Agricultura, Madrid: 187 pg.
AKSK (ed.): Forstliche Standortsaufnahme. Landwirtschaftsverlag, Münster: 188 pg.
Burschel, P. & Huss, J. (1987): Grundriss des Waldbaues.Parey Verlag. Hamburg & Berlin, 352 pg.
CATIE (ed.) (1984): Agroforestería. Actas del Seminario. Turralbía (Costa Rica): 112 pg.
Chertov, O.; Komarov, A. & Karev, G. (1999). Modern approaches in forest ecosystem modelling. EFI Research Report nº 8: 116 pg.
CPF (ed.) (1992): VIII Jornades Tècniques sobre Boscos, Sta. Perpètua de la Mogoda. Documentació Tècnica.
CPF (ed.) (1993): Aforestació de terrenys agraris. Sta. Perpètua de la Mogoda. 87 pg.
CTFC (ed.): La gestión sostenible de los bosques. Actas del Seminario. Vol. 3, Solsona: 319 pg.
Gandullo, J. M. et al. (1994): Estaciones ecológicas de los pinares españoles. OAPN, Ministerio de Medio Ambiente, Madrid: 187 pg.
IPROCOR (ed.) (1994): Atlas del alcornoque en Extremadura, Junta de Extremadura, Consejería de Agricultura y Comercio, Badajoz: 64 pg.
Lamprecht, H. (1986): Waldbau in den Tropen. Parey Verlag. Hamburg & Berlin: 318 pg.
Madrigal, A. (1999): Tablas de producción de los montes españoles. Fundación Conde del Valle de Salazar, Madrid: 253 pg.
Mayer, H. (1984): Waldbau. Fischer Verlag. Stuttgart: 514 pg.
Meson, M. & Montoya, M. (1994): Selvicultura mediterránea. Mundiprensa, Madrid: 368 pg.
Montoya, M. (1980): Los alcornocales. Ministerio de Agricultura, Madrid: 155 pg.
Montoya, M. (1990): El pino piñonero. Agroguías Mundiprensa, Madrid: 98 pg.
Montoya, M. (1993): Encinas y encinares. Mundiprensa, Madrid: 132 pg.
Montoya, M. (1995): El eucalipto. Mundiprensa, Madrid: 125 pg.
Montoya, M. & Mesón, M. (2004): Silvicultura. 2 tomos. Mundi Prensa & Fundación Conde del Valle de Salazar, Madrid 1142 pg.
Ortuño, F & Ceballos, A. (1997). Los bosques españoles. Incafo, Madrid.
Padró, A. & Oresanz, J. (1987): El chopo y su cultivo. MAPA Serie Técnica, Madrid: 446 pg.
Padró, A. (1992): Clones de chopo para el Valle medio del Ebro. DGA, Zaragoza: 203 pg.
Pardé, J. et al. (1994): Dasometría. Paraninfo: 387 pg.
Pelkonen, P., Pitkanen, A.; Schmidt, P.; Oesten, G.; Piusi, P. & Rojas, E.: (1999): Forestry in Changing Societies in Europe. National reports. Part II. Silva Network 1999-ICA. University of Joensuu, 480 pg.
Ramos, J.L. (1979): Selvicultura. ETSI de Montes-UPM, Madrid: 504 pg.
Reyna, S. (1992): La trufa. Agroguías Mundiprensa, Madrid: 120 pg.
Rodríguez, R. Et al. (1997): Manual de selvicultura del pino pinaster. Proyecto Columella.

Ruiz de la Torre, J. (1979): Árboles y arbustos. ETSI de Montes-UPM, Madrid: 512 pg.
Ruiz de la Torre, J. et al. (19996): Manual de la flora para la restauración de áreas críticas y diversificación de masas forestales. Junta de Andalucía, Consejería de Medio Ambiente, Sevilla: 208 pg.
Serrada, R. (1995): Apuntes de repoblaciones forestales. Fundación Conde del Valle de Salazar, Madrid: 380 pg.
SECF (ed.) (1996): Actas de la reunión sobre masas mixtas. Cuadernos de la SECF. 179 pg.
SECF (ed.) (2000): Actas de la reunión sobre selvicultura del pino carrasco. Cuadernos de la SECF nº 10: 208 pg.
Simposio Mediterráneo sobre regeneración del monte alcornocal (ed.) (1992): Actas. Mérida: 420 pg.
Terradas, J. (1996): Ecologia de foc. Proa, Barcelona: 270 pg.
Tolosana, E. et al. (2000): El aprovechamiento maderero. Mundiprensa, Madrid: 570 pg.
Universdad de Santiago de Compostela, Lugo: 75 pg.
Ximénez de Embún, J. (1977): El monte bajo. Ministerio de Agricultura, Madrid: 90 pg.