Plan 506 MÁSTER ERASMUS MUNDUS: MEDITERRANEAN FORESTRY AND NATURAL RESOURCES MANAGEMENT

Asignatura 53027 GENETIC RESOURCES CONSERVATION AND MOLECULAR MARKERS

Tipo de asignatura (básica, obligatoria u optativa)

Elective

Créditos ECTS

6 ECTS

Competencias que contribuye a desarrollar

2.1
Generales / Basic
G1 Knowledge of the basic elements of professional work in a practical way, analyzing and synthesizing relevant data and organizing and planning teams and processes
G2 Ability to communicate orally and written, both in specialized forums and for non-experts.
G4 Ability to work both as a team and independently in a local, regional, national or international context.
G5 Ability to take initiatives and develop entrepreneurship.

2.2
Específicas / Specific

In this course students will develop the following specific competences:

E7 Ability to apply different methods and techniques of analysis to address interdisciplinary problems in forest systems.
E11 Ability to search, select, generate and manage appropriate databases to obtain information relevant to the problems of forest management

Objetivos/Resultados de aprendizaje

The students will acquire a global vision of the main problems facing by the forest genetic resources, and will learn how to:

1. Evaluate the need of conservation and use of particular genetic resource
2. Decide on the more suitable strategy of conservation
3. Decide on the molecular tools suitable to identify genotypes and measure diversity in forest species
4. Understand the interplay between conservation and breeding in different contexts
5. Manage information on the main databases related with these topics

Contenidos

Bloque 1:
“Complex phenotypic traits and data associated”

1. Concepts and drivers of evolutionary change
2. Morphological / functional traits and life history features
3. The problem of homogenizing protocols
4. Quantitative genetics
5. Phenotypic plasticity, g x e interaction and trait correlation (integration)
6. The adaptive phenotype in conservation and deployment of forest genetic resources

Bloque 2:

“Molecular tools to evaluate intraspecific diversity and support decisions”

1. Molecular basis of biodiversity and potential consequences of mutations
2. Molecular markers & tools in detecting intraspecific biodiversity
3. Uses of genetic maps in breeding FGR
4. Basis for Molecular Genetic & Genomic Databases uses

Bloque 3:
“ Main problems and strategies for conservation of the forest genetic resources”

1.- FGR: concepts, state of the world’s FGR, main threats.
2.- Insight of population genetics to support the conservation of FGR.
3.- Distribution of the genetic variability in forest populations. Management of the geographic variability.
4.- Strategies of conservation of FGR: in situ, ex situ, circa situm.
5.- Main databases related to conservation of FGR.

Principios Metodológicos/Métodos Docentes

This course will rely on theoretical/practical lessons (with presentations), individual and group works based on case studies and extant databases, technical visits, hands-on seminars and lab practice.

Criterios y sistemas de evaluación

Continuous evaluation (active participation in the course)
25%

Personal and group projects presentations:
35%

Final exam
50%
The exam includes both theoretical and practical aspects

Recursos de aprendizaje y apoyo tutorial

Bloque 1
Falconer DS, Mackay FC (1996) Introduction to Quantitative Genetics (4th Edition). Pearson Education Limited. 480 pp.
Garnier E, Lavorel S, Poorter H, et al. (2013) New handbook for standardised measurement of plant functional traits worldwide. Australian Journal of Botany 61: 167–234.
Cornelissen JHC, Lavorel SB, Garnier EB, et al. (2003) A handbook of protocols for standardised and easy measurement of plant functional traits worldwide. Australian Journal of Botany 51: 335–380.
Schlichting CD, Pigliucci M (1998) Phenotypic evolution - A reaction norm perspective. Sunderland, MA.: Sinauer Associates. 387 pp.
Bloque 2
Bozeman Science: http://www.bozemanscience.com/ap-biology
SSR Database Evoltree (INRA) http://ssrdatabase.pierroton.inra.fr/login/login
GenBank https://www.ncbi.nlm.nih.gov/genbank/
Specific updated resources for each section will be available weekly on UVA-Moodle platform
Bloque 3
Eriksson G, Clapham ED 2006 An introduction to forest genetics. http://www.slu.se/Forest-Genetics-online
FAO, FLD & IPGRI. 2004. Forest genetic resources conservation and management. Vol 1: Overview, concepts and some systematic approaches. Rome.
FAO, D. IPGRI (2001) Forest genetic resources conservation and management, vol 2, In managed natural forests and protected areas (in situ). International Plant Genetic Resources Institute, Rome, Italy.
FAO, FLD, IPGRI. 2004. Forest genetic resources conservation and management. Vol. 3: In plantations and genebanks (ex situ). International Plant Genetic Resources Institute, Rome, Italy.
http://www.fao.org/forestry/fgr/publications/en/
Bozzano M, Jalonen R, Thomas E, Boshier D, Gallo L, Cavers S, ... Loo J (2014). The state of the world’s forest genetic resources–thematic study. Genetic considerations in ecosystem restoration using native tree species. FAO, Rome. The State of the World’s Forest Genetic Resources
Rao NK, Hanson J, Dulloo ME, Ghosh K, Nowell D, Larinde M (2006). Manual of seed handling in genebanks. Handbooks for Genebanks No. 8. Bioversity International, Rome, Italy (p. 4). ISBN 978-92-9043-740-6 Bioversity

International Via dei Tre Denari, 472/a 00057 Maccarese Rome, Italy Bioversity International.
Multilingual Glossary Forest Genetic Resources
http://iufro-archive.boku.ac.at/silvavoc/glossary/1_2en.html

Calendario y horario

First cuatrimester, Weeks 6 to 10.
Schedule:
https://drive.google.com/file/d/0BykR4j_DN5IbcGFYWjZoSzZVUkE/view

Tabla de Dedicación del Estudiante a la Asignatura/Plan de Trabajo

ACTIVIDADES PRESENCIALES/ Interaction with Faculty members
HORAS/ Hours
ACTIVIDADES NO PRESENCIALES/ Individual or group work
HORAS / Hours

Clases teórico-prácticas (T/M)/Theory
30
Estudio y trabajo autónomo individual/Individual study
70
Clases prácticas de aula (A)/Practical work (Problems,…)
10
Estudio y trabajo autónomo grupal/Group study
20

Laboratorios (L)/Labs
8

Prácticas externas, clínicas o de campo/Field trips
4

Seminarios (S)/Seminars
4

Evaluación/Evaluation
4

Total presencial
60
Total no presencial
90

Responsable de la docencia (recomendable que se incluya información de contacto y breve CV en el que aparezcan sus lineas de investigación y alguna publicación relevante)

Dr. Rosario Sierra de Grado rsierra@pvs.uva.es [1]; 979198418 http://sostenible.palencia.uva.es/users/rsierra
Dr. Elena Hidalgo Rodríguez ehidalgo@pvs.uva.es. 9108387
http://sostenible.palencia.uva.es/users/ehidalgo
Dr. José Climent Maldonado climent@inia.es [2] 913476862
http://sostenible.palencia.uva.es/users/jcliment

Idioma en que se imparte

English