28911 - Botany

Información del Plan Docente

Academic Year	2016/17
Academic center	201 - Escuela Politécnica Superior
Degree	437 - Degree in Rural and Agri-Food Engineering
ECTS	6.0
Course	2
Period	Half-yearly
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

They are used in a coordinated several procedures. 1º the theoretical foundations in the classroom are explained and further reading and study method proposed. 2º in the laboratory and in the field, with the presence of teachers, students must meet the anatomical and taxonomic aspects of plants. 3º students are responsible for various jobs that require field, laboratory and literature.

5.2.Learning activities

Theory classes. Classroom. Exhibition program theory. Readings and complementary work. It is available to the student

documents used in the explanatory theory.

Classes practices. The practicals are laboratory, classroom and field. In the first the student resolves the issues raised by the teacher concerning plants. Classroom instruction on the development of personal work that the student will have to occur. Field scheduled routes for recognizing species become.

Monitoring the work. Teachers, besides attending the doubts of the theory part, keep track of personal guidance and student work.

5.3.Program

Theory programme

1. Introduction to botany. Objectives and branches of botany. Agricultural botany.

2. Histology

2.1. Morphologic levels of organization. Pteridophytes, thallophytes, cormophytes.

2.2. Meristematic tissues. Growth and development. Characteristics ad functions.

2.3. Parenchymatic tissues. Characteristics and functions.

2.4. Support tissues. Collenchyma. Sclerenchyma. Characteristics and functions.

2.5. Vascular tissues. Xylem. Phloem. Characteristics and functions.

2.6. Surface tissues. Epidermis. Periderm. C haracteristics and functions.

2.7. Anatomy of plant organs.

3. Morphology

3.1. Morphology of cormophytes. Stem. General characteristics. Histology. Longevity. Ramification. Types of stem. Raunkiaer life forms.

3.2. The leaf. General characteristics. Leaf categories. Histology. Nerviation. Leaf morphology. Disposition and insertion in the stem.

3.3. The root. General characteristics. HIstology. Parts of the root. Types of roots.

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3.4. The flower. Phylogenesis of the flower. Floral whorls. Calyx. Corolla. Stamen. Gynoecium. Thalamus. Floral sexuality.

3.5. Inflorescences. Classification.

3.6. Seed primordia and pollen.

3.7. The fruit. Parts of the fruit. Types of fruit.

3.8. The seed. Parts of the seed. Germination.

4. Plant reproduction.

4.1. Plant reproduction. Sexual reproduction. Pollination and fertilization.

4.2. Dissemination of seeds and fruit.

4.3. Asexual reproduction. Vegetative reproduction and apomixes.

5. Plant systematics.

5.1. Fundamentals of systematics. Systems of classification in the plant kingdom. Synopsis of the plant kingdom.

5.2. Gymnosperms. General characteristics. Taxa of agronomic interest. *Pinaceae, Cupressaceae* .

5.3. Angiosperms. General characteristics. Taxa of agronomic interest. *Liliaceae, Gramineae*

5.4. *Ranunculaceae, Papaveraceae, Vitaceae*

5.5. *Leguminosae*

5.6. *Rosaceae, Fagaceae*

5.7. *Betulaceae, Juglandaceae*

5.8. *Cucurbitaceae, Salicaceae*

5.9. *Rutaceae, Malvaceae*

5.10. *Cruciferae, Polygonaceae*

5.11. *Caryophyllaceae, Chenopodiaceae*

5.12. *Amaranthaceae, Solanaceae*

5.13. *Oleaceae, Labiatae*

5.14. *Compositae, Umbelliferae*

5.15. Other taxa of agronomic interest.

Programme of Practicals

-Practicals concerning morphological description and identification. Laboratory with professor.

-Practicals concerning morphological description and identification. Student work. Field and laboratory.

-Practicals concerning phenology and monitoring of crops. Classroom and field. Student work.

5.4.Planning and scheduling

The schedule of classes, schedules, tutorials and examinations shall follow the academic calendar of the University of Zaragoza and the Polytechnic School of Huesca. Weeks:

01 Theory: 2h. Laboratory: 2h

02 Theory: 2h. Laboratory: 2h

03 Theory: 2h. Laboratory: 2h

04 Theory: 2h. Laboratory: 2h

05 Theory: 2h. Laboratory: 2h

06 Theory: 2h. Laboratory: 2h

07 Theory: 2h. Laboratory: 2h

08 Theory: 2h. Laboratory: 2h

09 Theory: 2h. Laboratory: 2h

10 Theory: 2h. Laboratory: 2h

11 Teoría: 2 h. Field: 2 h

12 Teoría: 2 h. Field: 2 h

13 Theory: 2h. Laboratory: 2h

14 Theory: 2h. Laboratory: 2h

15 Theory: 2h. Laboratory: 2h

5.5.Bibliography and recomended resources

- **BB**
- Aizpuru, I.; Aseginolaza, C.; Uribe-Echebarria, P. M.; Urrutia, P.; Zorrakin, I. 1999. Claves ilustradas de la Flora del País Vasco y territorios limítrofes. Servicio Central de Publicaciones del Gobierno Vasco. Vitoria.
- Castroviejo, S. et al. —Eds.— 1986-2015. Flora iberica. Plantas vasculares de la Península Ibérica e Islas Baleares. Vols. I-XV, XVI (I), XVII-XVIII y XX-XXI. Real Jardín Botánico, C.S.I.C. Madrid.
- Ascaso, J. (2014): Plantas de interés agronómico. Zaragoza: Prensas Universitarias
- Strasburger, E. et al. 2004. Tratado de Botánica. Omega. 35ª ed. Barcelona.
- Devesa Alcaraz, J. A.; Carrión, J. S. 2012. Las plantas con flor. Apuntes sobre su origen, clasificación y diversidad. Servicio Publicaciones Universidad de Córdoba.
- **BC**
- Fisiología vegetal / Juan Barceló Coll... [et al.] . - [Reimpr.] Madrid : Pirámide, reimp. 2003
- Bell, Adrian D.. Plant form : an illustrated guide to flowering plant morphology / Adrian D. Bell ; with line drawings by Alan Bryan Oxford ; New York : Oxford University Press, 1991
- Bold, Harold C.. Morfología de las plantas y los hongos / Harold C. Bold, Constantine J. Alexopoulos, Theodore Delevoryas . - [1a.ed.] Barcelona : Omega, D.L. 1988
- Bolòs, O.; Vigo, J. 1984-2002. Flora dels Països Catalans. Vols. 1-4. Ed. Barcino. Barcelona.
- Bolòs, O.; Vigo, J.; Masalles, R. M.; Ninot, J. M. 2005. Flora manual dels Països Catalans. Ed. Pòrtic. 3ª ed. Barcelona.
- Bracegirdle, Brian. Atlas de estructura vegetal / Brian Bracegirdle y Patricia H. Miles Madrid : Paraninfo, 1982
- Cortés Benavides, Felipe. Cuadernos de histología vegetal / Felipe Cortés Benavides. - [3a. ed. esp.] Madrid : Marbán, D.L. 1990
- Esau, Katherine. Anatomía vegetal / Katherine Esau ; traducido por José Pons Rosell . - 3a. ed. rev., reimp. Barcelona : Omega, 1985
- Fahn, A.. Anatomía vegetal / A. Fahn ; [traducción de Javier Fernández Casas, Fernando García Arenal, Joaquín Fernández Pérez] Madrid : Ediciones Pirámide, D.L.1985
- Font Quer, P. 1982. Diccionario de Botánica. Ed. Labor. 8ª reimp. Barcelona.
- Font Quer, Pío. Iniciación a la botánica : morfología externa / Pius Font i Quer . - 2a. ed. en castellano / actualizada por Oriol de Bolòs Barcelona : Fontalba, 1986
- Gorenflot, Robert. Biologie végétale: plantes supérieures / Robert Gorenflot. - 3e éd. rév. et augm. Paris [etc.] : Masson, 1990
- Krommenhoek, W.. Atlas de histología vegetal / W. Krommenhoek, J. Sebus, G. J. van Esch Madrid : Marbán, 1986
- Raven, Peter Hamilton. Biología de las plantas / Peter H. Raven, Ray F. Evert, Susan E. Eichhorn ; versión española por Sergi Santamaría del Campo, Francisco Lloret Maya, Mª Angeles Cardona Florit . - Ed. en español Barcelona : Reverté, cop.1991
- El reino vegetal / R.F. Scagel ... [et al.] ; [trad. por Joan Ayala] . - Nueva ed. rev. y ampl. Barcelona : Omega, 1987
- Tutin, T. G.; Heywood, V. H.; Burges, N. A.; Moore, D. M.; Valentine, D. H.; Walters, S. M.; Webb, D. A. —Eds.— 1964-1980. Flora Europaea. Cambridge University Press. 5 vols. Cambridge.
- Botánica / Jesús Izco...[et.al] . 1ªed., 1ª reimp. Madrid[etc.] : McGraw-Hill : Interamericana, D.L. 1998

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- Simpson, B. B.; Ogorzaly, M. C. 2001. Economic Botany. Plants in our World. McGraw-Hill. 3º ed..