
COURSE: BOTANY

ACADEMIC YEAR: 2016-17

TYPE OF EDUCATIONAL ACTIVITY: Basic

TEACHER: Prof. Carmine Colacino

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Language: **ITALIAN** (ENGLISH on demand)

ECTS: 6 (4 of lessons and
2 of practical classes)n. of hours: 56 (48 of
lessons and 24 of practical
classes)Campus: Potenza
Department of Science
Program: Biotechnology (L2)Semester: 2nd (from
about 6 March to 15-
30 June 2016)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

This course has among its objectives: a) to highlight the close correlation between form and function of living organisms, for this purpose we will examine with some detail the histology, anatomy and morphology of vascular plants (Angiosperms and Gymnosperms). This will be correlated with the main aspects of Physiology. The basic cytological, as well as, chemical concepts, essential to the understanding of most of the topics of this course, must already have been acquired from the courses of General Biology, General and Inorganic Chemistry, and possibly Organic Chemistry (whose exams should be taken preferably before this one, but it is not required). b) to highlight the diversity of plants, their evolutionary history, and to familiarize the student with the main groups of plants. c) From a practical point of view, to provide students of Biotechnology with the concepts required to study and understand the applied biological subjects addressed in subsequent years, particularly with reference to plants. d) From a cultural point of view, to allow a conscious approach to some of the major environmental problems, the use of biodiversity, the biotechnologies, and the importance of plants in the world in which we live. The core theme of biology, and of course, of this course too, is evolution, which has allowed a unitary interpretation of the enormous diversity of living organisms, their interactions, distribution, etc.

PRE-REQUIREMENTS

Elementary notions from the courses of GENERAL BIOLOGY, GENERAL and INORGANIC CHEMISTRY, ORGANIC CHEMISTRY

SYLLABUS

Note: *The basics of cytology and genetics are considered already acquired from the General Biology course.* Photosynthesis, photorespiration, carbon concentration methods (CCM): CAM and C4. Structure and function: Meristems and tissues; Stems and roots: Primary and secondary Growth; Leaves. Resource Acquisition and Transport in Vascular Plants. Physiology of long-range transport (xylem and phloem). Flower and sexual reproduction (meiosis and alternation of generations), seeds and fruits. Asexual reproduction. Plant biotechnology and genetic engineering. Plant responses to internal and external signals (hormones, plant photoreceptors, biological clock, phototropism, pathogens and herbivores). Descent with modifications: A Darwinian View of Life. The evolution of Populations. The Origin of Species. Microevolution and Macroevolution. The History of Life on Earth. Phylogeny and the Tree of Life. Plant classification (binomial system).

The Evolutionary Record and Methods of reconstruction. Earliest Forms of Plant Life. The Colonization of Land. The First Forests. Major Emergence of the Seed Plants. Flowering Plants Origins. The Past 66 Million Years. Mass Extinctions and Persistent Populations. Evolutionary Theories and The Plant Fossil Record. Fungi.

TEACHING METHODS

Theoretical lessons, Laboratory tutorials,

EVALUATION METHODS

Intermediate verifications (Tests, they are optional and accessible only to the students following the lessons).

Final Oral examination with verification of the ability to use a microscope and to recognize the main anatomical characteristics of plants (slides), evaluation of a personal herbarium of 10 different species prepared according to the guidelines indicated during the practical classes.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Reece, Urry, Cain, Wasserman, Minorsky, Jackson. 2015. *Campbell - La forma e la funzione delle piante* (10^a edizione). Pearson, or original English language Edition, same Publisher.
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- Reece, Urry, Cain, Wasserman, Minorsky, Jackson. 2015. *Campbell - Meccanismi dell'evoluzione e origine della diversità* (10^a edizione). Pearson - or original English language Edition, same Publisher (Chapters 1-5; 8-10; or 22-26; 29-31 in the one book edition),.
 - Willis & McElwain. 2014. *The Evolution of Plants*. 2nd edn. Oxford.
 - Regarding the importance of plants in the history of the earth you can read: David Berling (2008). *The Emerald Planet*. Oxford University Press; On Evolution and its social implications you can read: S.J. Gould (1981). *The Mismeasure Of Man*. Norton.
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INTERACTION WITH STUDENTS

During classes (and after), by e-mail, and in my office in the hours indicated, or by appointment.

EXAMINATION SESSIONS (FORECAST)¹

28 February 2017 - 4 and 11 July 2017 - 26 September 2017 - 3 October 2017 – 8 November 2017

SEMINARS BY EXTERNAL EXPERTS YES ☐ NO ☒

FURTHER INFORMATION

On-line registration is required within one week before the date of the exam. Access the University web site: Esse3 Servizi Online. To be admitted your personal Herbarium of 10 plant species (prepared according to the instructions in the Guide) must be presented to the teacher one week before the date of the exam (exact dates and hours on the teacher's web page). For updates and changes refer to the teacher's web page.

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.