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**COURSE: BOTANY**

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**ACADEMIC YEAR: 2017-2018**

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**TYPE OF EDUCATIONAL ACTIVITY:**

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**TEACHER:** Prof. Carmine COLACINO

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e-mail: carmine.colacino@unibas.it

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website: oldwww.unibas.it/utenti/colacino/

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phone: 0971206234

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mobile (optional):

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

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ECTS: (lessons e tutorials/practice) 6 (4 + 2)	n. of hours: (lessons e tutorials/practice) (32 + 24)	Campus: <b>Potenza</b> Dept./School: <b>Dipartimento di Scienze</b> Program: <b>Biotechnology</b>	Semester: 2nd (date) 5 March to 15- 30 June 2018
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**EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES**

The course of botany course aims to provide a basic knowledge of plant biology for the study and understanding of the applied subjects to be addressed in subsequent years. From a cultural point of view, the course of botany, aims to allow a conscious approach to some of the major environmental problems, and on the sustainable use of biodiversity and biotechnology. The central theme of this course is evolution, which has allowed a unified interpretation of the enormous diversity of living organisms, their interactions with each other, their distribution, etc.

Tutorials: Anatomy of Spermatophyta and use dichotomous keys for the identification at the species level of ferns and angiosperms.

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**PRE-REQUIREMENTS**

A basic knowledge of GENERAL BIOLOGY, GENERAL CHEMISTRY and INORGANIC CHEMISTRY, ORGANIC CHEMISTRY (but is not required to pass these courses before that of BOTANY)

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**SYLLABUS**

*A basic knowledge of cytology and genetics is considered already acquired from the course of general biology.* Photosynthesis, photorespiration, carbon concentration methods (CCM): CAM and C4. Structure and function: Meristems and tissues; Stem and root: primary and secondary Structure; Leaves. Physiology of long distance transport (xylematic and phloematic transport). Absorption of water and nutrients, soil and nutrition. Flower and sexual reproduction (meiosis and alternation of generations), seeds and fruits. Asexual reproduction. Plant biotechnology and genetic engineering. Reactions to internal and external signals (plant hormones, phytochromes, biological clock, phototropism, defense).

A Darwinian conception of life. Development of the theory of evolution; microevolution: genetic changes within populations; speciation; macroevolution. The phylogeny and the tree of life. Classification of plants (binomial system). Evolutionary data and their reconstruction. The earliest forms of plant life. The colonization of the Land. The first forests. The Spermatophyta. Origin of Angiosperms. The last 66 million years. Mass extinctions and persistent populations. Evolutionary theories and plant fossils.

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**TEACHING METHODS**

Classroom lectures, lab exercises

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**EVALUATION METHODS**

Intermediate tests (these are optional and reserved to students actively following and participating in classroom lectures and lab exercises). Final oral examination (for everyone) with a practical part checking the student skill in using the microscope and in analyzing prepared plant anatomic slides. Assessment of a herbarium of 10 species prepared by the student (to be delivered one week before the date of the examination.)

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**TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL**

- \* Reece, Urry, Cain, Wasserman, Minorsky, Jackson. 2015. Campbell - *La forma e la funzione delle piante (10a edizione)*. Pearson (use English edition instead)
- \* Reece, Urry, Cain, Wasserman, Minorsky, Jackson. 2015. Campbell - *Meccanismi dell'evoluzione e origine della diversità (10a edizione)*. Pearson (Cap. 1-5; 8-10) (use English edition instead)
- \* Willis & McElwain. 2014. *The Evolution of Plants. 2nd edn.* Oxford.

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Lab exercises: SPERANZA, CALZONI (1996). *Struttura delle piante in immagini*. Zanichelli (available in the Library) and *Guida alla preparazione dell'erbario* (downloadable from the teacher's web site, gives guidelines for the preparation of the personal Herbarium to be presented at the examination.) The guides (Floras) for the identification of plant species will be made available during the lab classes. These are in Italian. Alternatively, Floras in English language can be used (e.g. Flora Europaea).

**Other texts (optional)**

- \* Evert, Eichhorn, 2013. *La biologia delle piante di Raven*. 7a ed. Italiana (8a Americana). (use English edition instead)
- \* **NOTE:** to assess the importance of plants to the history of earth you should read: David Berling (2008). *The Emerald Planet*. Oxford University Press; On evolution and its social implications you should read: S.J. Gould (1981). *The Mismeasure of Men* (any edition)

Other material is available on the teacher's website (external links, downloadable tutorials)

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**INTERACTION WITH STUDENTS**

Mainly before and after class hours, by e-mail and during Office hours. By rendez-vous.

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**EXAMINATION SESSIONS (FORECAST)<sup>1</sup>**

30 January and 6 February 2018 (for students of the second year and later) - 3 and 10 July 2018 - 25 September 2018 - 2 October 2018 – 6 November 2018

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**SEMINARS BY EXTERNAL EXPERTS**    YES     NO

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**FURTHER INFORMATION**

Registration is required on the University's website: Esse3 Online service and must be completed within one week before the date of the exam. To access the examination you must deliver your Herbarium of 10 plant species (prepared according to the instructions of the Guide) within one week before the date of the appeal. For updates and changes refer to the teacher's web page.

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