



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2019/2020		
BACHELOR'S DEGREE (BSC)	BIOTECHNOLOGIES		
SUBJECT	PLANT BIOLOGY		
TYPE OF EDUCATIONAL ACTIVITY	A, B		
AMBIT	50081-Discipline biotecnologiche con finalità specifiche: biologiche e industriali 50077-Discipline biologiche		
CODE	20766		
SCIENTIFIC SECTOR(S)	BIO/01		
HEAD PROFESSOR(S)	SCIALABBA ANNA	Cultore della Materia	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	98		
COURSE ACTIVITY (Hrs)	52		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	SCIALABBA ANNA Wednesday 10:00 - 14:00 Dipartimento STEBICEF. Sezione Botanica ed Ecologia Vegetale. Via Archirafi. 38A previo appuntamento via e-mail.		

DOCENTE: Prof.ssa ANNA SCIALABBA

PREREQUISITES	Fundamentals of Cellular Biology, General and Organic Chemistry.
LEARNING OUTCOMES	<p>Knowledge and comprehensive ability: To know and to understand the basic concepts of plant biology at the cellular and organismic levels in relation to their use in the biotechnology field.</p> <p>Ability to apply knowledge and understanding: To apply the gained knowledge in order to perform the diagnostic detection of cells, tissues and organs of plant through microscopic observations or images and diagrams.</p> <p>Making judgments: Ability to analyze and synthesize for elaborating critical thinking on the issues studied and to evaluate the changes induced by the environment on plant organisms</p> <p>Communicative ability: To express in understandable way, even for a non-expert audience, the importance of knowledge of the cell biology basic concepts and processes affecting plant structure.</p> <p>Learning ability: To integrate the knowledge of cell biology with histology and plant anatomy to investigate issues of plant biotechnology at the cellular, organ and organismic level.</p>
ASSESSMENT METHODS	<p>At the end of each didactic unit, a discussion in order to verify the students' understanding, also using questions that may be asked to the final exam will be proposed. Learning evaluation will be based on written tests.</p> <p>The written tests are represented by an ongoing evaluation and a final test lasting ninety minutes on topics reported in the program, referring to the suggested basic texts and the teaching material if provided by the teacher. The written tests are semi-structured and consist of a minimum of thirty questions. The recognition of schemes and figures aims to evaluate the knowledge gained during laboratory activity. Closed questions tend to test the knowledge of the disciplinary scope of the course while the open questions tend to verify the mastery of the subjects, the properties of language and the ability to apply knowledge and skills to solve issues proposed. The written test is passed with the evaluation of 18/30 when the student is in possession of the minimum basic knowledge of the main topics of teaching and the technical language and minimal ability for independently applying the gained knowledge. The evaluation of 30/30 applies when the student shows full knowledge of the topics of the program. The 30/30 vote with any praise is given when the knowledge/skills are excellent and student is able to elaborate and express judgments based on acquired knowledge.</p> <p>The final exam score is expressed in thirtieth.</p>
EDUCATIONAL OBJECTIVES	The course provides knowledge on structural and functional bases of plants, highlighting the differences between animal and vegetable organisms. Will be analyzed aspects relating to the characteristics of the cells, tissues and organs of the plants including in relation to its use as a system for biotechnological applications.
TEACHING METHODS	Lectures and exercises.
SUGGESTED BIBLIOGRAPHY	<p>Testo base consigliato:</p> <p>-Pasqua G., Abbate G., Forni C. 2015. Botanica generale e diversita' vegetale. Piccin.</p> <p>Testi utilizzati per l'insegnamento:</p> <p>-Curtis, H. 2017. Invito alla Biologia. Zanichelli.</p> <p>-Mauseth J.D., 2014 – Botanica. Idelson Gnocchi. Napoli.</p> <p>-Gerlach D., Lieder J.2014. Atlante di Anatomia Vegetale.Ed. Muzzio.</p>

SYLLABUS

Hrs	Frontal teaching
8	Introduction. General principles of plant evolution. Tallo and Corm. Difference between animal organisms and plants. Asexual and sexual reproduction. The life cycle of angiosperms. Flowers, fruits and seeds.
2	Plant cells and hierarchical compartmentalization of the plant body. Cellar membranes. Cytoskeleton and cell division. Microbodies.
2	Plastids: role within the cell, origin and structure. Chloroplasts: origin, morphology and structure. Leucoplasts, chromoplasts and etioplasts. Photosynthetic pigments.
2	Vacuole: role within plant cells, tonoplast, vacuolar content, osmotic phenomena, secondary metabolites.
2	Cell Wall: role, biogenesis, primary and secondary wall, primary pit-field and plasmodesmata.
8	Morphological and functional organization. Pseudo-tissues and tissue systems. Meristem, epidermis, periderm, parenchyma, collenchyma, sclerenchyma, xylem, phloem and secretory tissues. Totipotency, determination, differentiation and transdifferentiation. Callus
10	Organography. Root: apex structure, primary and secondary structure, actinostele, secondary roots, adventitious, ancillary, amended. Caule: apex structure, primary and secondary structure, and eustele atactostele, omoxilo wood and eteroxilo, branching, changes. Leaf morphology and structure, modifications, foliar trace, abscission. commercial value of woody stems and fibers
6	The role of growth and development hormones. The short and long distance transport. ecophysiological aspects of photosynthesis

Hrs	Practice
12	- Use of morphological characters for the recognition of the plants. - Tissue sampling. Histological techniques for the anatomical recognition and diagnosis of tissues, cells, organelles and reserve substances present in the seagrass. Observations by light microscopy. - Plant-environment activities' aimed observation of specialization at the anatomical, morphological and reproductive adaptation sets with focus on the evolutionary advantages of such metamorphosis