

COURSE OF STUDY: *PHARMACY*
ACADEMIC YEAR: *2024-2025*
CORSO INTEGRATO: *ANIMAL AND PLANT BIOLOGY WITH ELEMENTS OF PHARMACEUTICAL BOTANICS*
ACADEMIC SUBJECT: *ELEMENTS OF PHARMACEUTICAL BOTANY*

General information	
Year of the course	I - First
Academic calendar (starting and ending date)	1 ST Semester (October 2024 – February 2025)
Credits (CFU/ETCS):	4 (FOUR)
SSD	BIO15 (BIOS 01-D)
Language	Italian
Mode of attendance	Obbligatory, in presence

Professor/ Lecturer	
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Department and address	Department of Physical Activity and Health, Research Institute, Sports University of Tirana. Rr. "M. Gjollështa", AL-1001, Tirana, Albania
Virtual room	
Office Hours (and modalities: e.g., by appointment, on line, etc.)	At Catholic University premises. By appointment agreed on students' demand via Google Classroom of the course

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars , field trips)	Out-of-class study hours/ Self-study hours
100	24	15	61
CFU/ETCS			
4	3	1	

Learning Objectives	The training activity, closely integrated with plant biology, provides knowledge on the botanical aspect of plant drugs used in the pharmaceutical field
Course prerequisites	<i>Since it is a first-year course, there are no other prerequisites than the ones required to access the degree course</i>

Teaching strategies	Lectures, workshops, interactive seminars prepared by students and brainstorming on teaching topics
Expected learning outcomes	Acquisition of knowledge for the botanical (macroscopic and microscopic)

in terms of	and metabolic (knowledge of the active ingredients) recognition of the main medicinal and officinal plants for herbal, pharmaceutical and cosmetic use present in the European Pharmacopoeia and those taken into consideration by the European Medicines Agency EMA.
Knowledge and understanding on:	<p>Knowledge of Plant Biology</p> <ul style="list-style-type: none"> ○ General aspect of Pharmaceutical Botany <p>General notions of Pharmaceutical Botany</p>
Applying knowledge and understanding on:	<ul style="list-style-type: none"> • ability to understand characteristics and distinguish structural aspects at tissue, organ and system levels of plants and elements of plant physiology • ability to classify and identify cell/plants of pharmaceutical interest and their products • Ability to classify and recognize the main medicinal plants from a botanical and metabolic point of view
Soft skills	<ul style="list-style-type: none"> • Making informed judgments and choices -develop and practice the ability to apply the theoretical and practical knowledge in simulated or concrete situations in correlation arguments between plant cells and superior levels of plant organization, such as tissues, organs and systems in plants -develop and practice the ability to apply the theoretical and practical knowledge in simulated or concrete situations in correlation arguments between Plant Biology and applications in the pharmaceutical field • Communicating knowledge and understanding • Ability to communicate with one's peers and superiors of the acquired knowledge • Capacities to continue learning <ul style="list-style-type: none"> ○ Notions for studying at a higher degree, facilitate orientation in the employment environment and apply knowledge in a creative way
Syllabus	
Content knowledge	<p><i>Definition and aims of Pharmaceutical Botany.</i></p> <p><i>Difference between plants and animals.</i></p> <p><i>Usefulness of plants for humans.</i></p> <p><i>Systematics of Plants; definitions and criteria as a source of substances of pharmaceutical interest. Systematics: definition and purposes.</i></p> <p><i>Classification criteria of the plant kingdom.</i></p> <p><i>Main taxonomic groups: Tallofita: Alghe, Funghi, Licheni. Briofite. Spermatofite: Pteridofite. Gimnosperme. Angiosperme..</i></p> <p><i>Plant tissues and organs: general notions.</i></p> <p><i>Notions of plant physiology.</i></p> <p><i>Energy in plant cells: photosynthesis, C3, C4 and CAM plants.</i></p>

	<p>Systematic overview/classification, description of the main botanical characteristics of the drug and the active ingredients. Main plant taxa of pharmaceutical interest.</p> <p><i>Botanical characteristics useful for the recognition of medicinal plants: morphology of stem, roots, leaves, flowers and fruits. Tallophyta: morphological characteristics of algae of pharmaceutical interest. Rhodophyta, Pheophyta, Chlorophyta. Cormophyta: description of the main morphological characteristics: Spermatophyta: Angiospermae and Gymnospermae. Definition of drug. Relationship between plant and active ingredients. General metabolites and specialized metabolites. Endogenous and exogenous factors that influence the production of active ingredients in plants of pharmaceutical interest. Notes on the use of plant biotechnology in the production of active ingredients. Main types of pharmaceutical interest. Study of approximately 50 plant species of important medicinal and pharmaceutical interest: botanical description, geographical distribution, part of the plant used, active ingredients of pharmaceutical interest.</i></p>
Texts and readings	<ol style="list-style-type: none"> 1. Evert R., Eichhorn S.- La biologia delle piante di Raven- (7th edition) Ed. Zanichelli 2. Senatore F.- Biologia e Botanica farmaceutica- (2nd edition) Ed. Piccin 3. Maugini E. et al., Manuale di Botanica Farmaceutica, Piccin editore, IX edizione
Notes, additional materials	Scripts, PPT lectures and other materials made available by the responsible professor
Repository	

Assessment	
Assessment methods	The exam consists of a written and an oral test.
Assessment criteria	<ul style="list-style-type: none"> • Knowledge and understanding <ul style="list-style-type: none"> ○ appropriateness, correctness, and congruence of knowledge acquired during the course • Applying knowledge and understanding <ul style="list-style-type: none"> ○ Illustrating methodological interconnections between the various topics of the course • Autonomy of judgment <ul style="list-style-type: none"> ○ The student must be able to rationally interpret and illustrate case studies in the development of drugs • Communicating knowledge and understanding <ul style="list-style-type: none"> ○ Expressive capacity ○ Appropriate use of the specific language of the discipline ○ Logical skills and consequentiality in the connection of contents • Communication skills <ul style="list-style-type: none"> ○ Ability to connect different topics by finding common points and to establish a coherent general design, taking care of the

	<p>structure, organization, and logical connections of the expository discourse</p> <ul style="list-style-type: none"> ○ Ability to synthesize also with the symbolism of the material and the graphic expression of notions and concepts, for example in the form of formulas, schemes, equations. ● Capacities to continue learning <ul style="list-style-type: none"> ○ Development of the necessary learning capacities for practical application of knowledge and skills acquired during the course
Final exam and grading criteria	<p>The final grade is awarded out of thirty. The exam is passed when the grade is greater than or equal to 18. The grade is determined by an overall evaluation concerning the clarity of the presentation, the completeness of the acquired knowledge, the property of the specific vocabulary of the subject, the depth of knowledge, and the ability to analyze questions and provide suitable answers.</p> <p>In particular, the grade breakdown is as follows:</p> <p>Insufficient: 0-17 Lack of, incomplete, and inadequate knowledge of the topics contained in the syllabus, use of non-technical vocabulary</p> <p>Sufficient: 18-20 Sufficient knowledge of the topics contained in the syllabus and overall adequacy of the technical vocabulary used</p> <p>Adequate: 21-23 Adequate knowledge of the topics contained in the syllabus, adequate ability to argue and make connections between the various topics, use of appropriate technical vocabulary</p> <p>Good: 24-26 Good knowledge of the topics contained in the syllabus, good capacity for in-depth analysis and criticism through the use of an adequate technical vocabulary</p> <p>Distinguished: 27-28 More than good knowledge of the topics contained in the syllabus, more than good capacity for in-depth study, for linking the various topics, for critique and mastery of technical vocabulary</p> <p>Excellent: 29-30 Excellent knowledge of the topics contained in the syllabus, excellent ability to deepen and link between the different topics, as well as criticism and mastery of the technical vocabulary</p> <p>Excellent: 30L Excellent knowledge of the topics contained in the syllabus, outstanding capacity for in-depth study, for linking the various topics, for critique and mastery of the technical vocabulary</p>
Further information	