UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali
ACADEMIC YEAR	2021/2022
BACHELOR'S DEGREE (BSC)	VITICULTURE AND OENOLOGY
SUBJECT	VITICULTURAL PATHOLOGY
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50121-Discipline della difesa
CODE	05595
SCIENTIFIC SECTOR(S)	AGR/12
HEAD PROFESSOR(S)	BELLA PATRIZIA Professore Associato Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	90
COURSE ACTIVITY (Hrs)	60
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	2
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**BELLA PATRIZIA** Tuesday 09:00 10:00 Stanza del docente - Dipartimento di Scienze Agrarie, Alimentari e Forestali. Edificio 5 - Palermo Friday 11:00 12:00 Sede del CdL "Palazzo Principe di Napoli" - Trapani o via applicativo Teams

DOCENTE: Prof.ssa PATRIZIA BELLA

PREREQUISITES	In order to acquire the skills necessary to participate appropriately in the learning process, the students should possess knowledges on plant biology, agronomy, microbiology genetics and viticulture.
LEARNING OUTCOMES	Knowledge and understanding Basic knowledge on the general aspects of plant pathology necessary for the study of the major grape diseases, their diagnosis and management. Applying knowledge and understanding Ability to apply a scientific language appropriate to the discipline. Capacity to correlate the acquired knowledge to make a correct diagnosis and define appropriate control strategies. Making judgements Ability to make hypotheses about the possible causes of the disease and to select the appropriate control strategies taking into account grapevine phenological growth stages and environmental factors that cause disease in plants, including the mechanisms by which these factors cause diseases (host–pathogen interactions). Communication skills Ability to discuss the topics of the discipline with a proper scientific language that can be understood even by a non-expert public. Learning skills Ability to acquire new knowledge by searching and reading scientific literature pertaining to plant pathology and related disciplines.
ASSESSMENT METHODS	The student will take a written and an oral exam. The written test will consist of multiple choice answers and open-ended questions. The written examination lasts a total of 3 hours. The multiple-choice test will focus on the general concepts of plant pathology, characteristics and biology of the plant pathogens, and the control methods. It will allow to verify the reasoning skill of the student and the level of knowledge acquired. The open-ended questions will provide additional tools for the evaluation of the knowledge acquired and will allow to ascertain the critical and synthesis skills. The assessments will be make using scores ranging from 18 (minimum) to 30 (maximum). Only those who pass the written test can access to oral exam, which is focused on major grape diseases. The students that fail or cannot take the written test, must take an oral exam on the entire program. For the oral exam, students will have to answer at least three questions on the most important grapevine diseases. The student taking only the oral exam will have to answer at least five questions. The oral exam will be useful to ascertain the ability to properly discuss and correlate the topics of the discipline. The student must also use appropriate scientific language. The examination is considered unsatisfactory if the student shows a superficial knowledge of the topics and exposes them in unclear manner. Sufficient or satisfactory evaluation is expected if the student demonstrates a basic level of knowledge and a little or a limited ability to interconnect the different contents of the discipline. The evaluation is good or excellent if the student demonstrates a good or excellent knowledge of the subjects, which are described with an appropriate or perfect scientific language. In addition, the student is able to correlate the different contents of the discipline and to apply knowledge to solve the problems proposed.
EDUCATIONAL OBJECTIVES	Acquire basic knowledge on general aspects of plant pathology, the characteristics and biology of the pathogens (fungi, bacteria, viruses, viroids, and phytoplasmas), the principles of the diagnosis and control strategies. Acquire knowledge and skills on major grapevine diseases and their management.
TEACHING METHODS	Lectures (40 h) Laboratory exercises (16 h) Field visits (4 h)
SUGGESTED BIBLIOGRAPHY	Vannacci et al., 2021 Patologia Vegetale - EdiSes Università Matta, Buonaurio, Scala, 2017. Fondamenti di patologia vegetale – Patron Editore Belli, 2011. Elementi di Patologia Vegetale- Piccin Editore Borgo, Avversità della vite, 2016 - Giorgio Sartori Editore Copia appunti delle lezioni sotto forma di presentazioni Power Point su supporto informatico; protocolli delle esercitazioni; articoli scientifici e/o divulgativi sulle malattie

SYLLABUS

Hrs	Frontal teaching
2	General aspects: the concept of disease in plants; Infectious and non-infectious plant diseases; types of plant diseases.

SYLLABUS

Hrs	Frontal teaching
2	The disease cycle: inoculation, prepenetration phenomena, penetration, infection, colonization, dissemination of the pathogen, overwintering of pathogens
1	The mode of attack of plant by plant pathogens: necrotrophic and biotrophic colonization
2	Plant disease epidemiology: host, pathogen and environmental factors that affect the development of epidemics, measurement of plant disease, plant disease forecast systems
5	Fungi, bacteria, virus, viroid and phytoplasmas: morphology, reproduction, ecology and dissemination
2	Plant disease diagnosis: Symptoms and Signs, Isolation and identification oh fungi and bacteria, Identification of fungi based on microscopic features, serological and molecular methods, Koch's postulates
2	Plant defence mechanisms: preexisting structural and chemical defences; induced structural and biochemical defences; host-pathogen interaction, Systemic Acquired Resistance, Rhizobacteria-induced systemic resistance
3	Control of plant diseases: cultural, physical, biological and chemical methods; use of resistant varieties; integrated control of plant disease.
11	Plant diseases caused by fungi: Downy mildew of grape (Plasmopara viticola), Powdery mildew of grape (Erysiphe necator), Gray mould of grape (Botrytis cinerea), Black rot (Phyllosticta ampelicida), Esca disease of grape (Phaeomoniella chlamydospora, Phaeoacremonium minimum, Fomitiporia mediterranea) and other grapevine trunk diseases.
4	Plant diseases caused by bacteria: crown gall of grape (Allorhizobium vitis), Pearce's disease and other diseases caused by Xylella fastidiosa
2	Plant diseases caused by phytoplasmas: Flavescence dorée ('Candidatus Phytoplasma vitis') and Bois noir ('Candidatus Phytoplasma solani')
4	Plant diseases caused by virus: Grapevine fanleaf degeneration disease: (Grapevine fanleaf virus, GFLV); Grapevine leafroll disease: (Grapevine leafroll-associated virus ,GLRaV) Rugose wood complex (Grapevine rupestris stem pitting-associated virus, GRSPaV; Grapevine virus A, GVA; Grapevine virus B GVB; other Vitivirus)

Hrs	Workshops
16	Laboratory exercises: Analysis of plant disease samples and description of symptoms; Isolation of fungi and bacteria from plant disease samples; serological assays (ELISA); identification of fungi and bacteria by PCR.

Hrs	Others
4	Visits to vineyards and identification of symptoms the major grape diseases