General Information	
Academic subject	**Biological and Integrated Protection from the diseases (module of I.C. Plant Protection)**
Degree course	**Master in Plant Medicine (LM69)**
Curriculum	
ECTS credits	6
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Francesco FARETRA	francesco.faretra@uniba.it	AGR12

ECTS credits details			
Basic teaching activities	Plant Protection disciplines		

Class schedule	
Period	First semester
Year	Second year
Type of class	Lectures, 4 ECTS (32 hours) Laboratory and field classroom and workshops, 2 ECTS (28 hours)

Time management	
Hours	150
In-class study hours	60 (32 Lectures + 28 Lab & field cl.)
Out-of-class study hours	90

Academic calendar	
Class begins	September 30, 2019
Class ends	January 17, 2020

Syllabus	
Prerequisites/requirements	Knowledge of Plant Pathology requests for admission to the Master course.
Expected learning outcomes	*Knowledge and understanding* o Knowledge and understanding of principles, methods and tools for plant protection from diseases. o Knowledge and understanding of the European and National regulations on plant protection products. o Knowledge and understanding of classification of fungicides, their modes of action and resistance. *Applying knowledge and understanding* o Knowledge and understanding of the sustainable usage of pesticides. o Knowledge and understanding for a rational approach to planning crop protection strategies. o Knowledge and understanding of the phenomenon of acquired

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http://www.uniba.it/ricerca/dipartimenti/disspa/attivita-didattica/corsi-di-studio/corsi-di-studio-2017-2018/clm-mdp-medicina-delle-piante-2017-2018
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	fungicide resistance. *Making informed judgements and choices* o Ability to understand how disease epidemiology influences crop protection strategies. o Ability to understand how to prevent and/or manage fungicide resistance. o Ability to plane crop protection strategies aimed at ensuring yield, quality safety and security and at minimizing the environmental impact and risks for human health. *Communicating knowledge and understanding* o Ability of describing suitable biological and integrated protection strategies for the most important Mediterranean crops. o Ability of evaluating the benefits, risks and negative side effects of crop protection strategies. o Ability of evaluating the sustainability of crop protection strategies. *Capacities to continue learning* o Capacities of updating the knowledge on crop protection and related regulation. The results of the expected learning, in term of knowledge and ability, are listed in the Annex A of the Didactic Regulation of the Bachelor Course (expressed by the European descriptors of the study title).
Contents	Presentation of the course and educational aims. Historical evolution of crop protection. Normative on the commercialization and usage of plant protection products and microbial antagonists. Crop protection: environmental sustainability and food safety. Functional classification of fungicides and their modes of action. Resistance of fungi to fungicides: genetic and biochemical bases, methods for detection, prevention and management. Biological control. Inducers of resistance (SAR). Crop protection in organic agriculture. Integrate Pest Management (IPM) guidelines. Certification of quality and crop protection. Decision Supporting Systems: forecasting models, expert systems and warning systems. Integrated protection from diseases of grapevine, stone fruits, olive, citrus and protected crops.
Course program	
Bibliography	• Personal notes of the lectures and didactic materials distributed during the course. • Lorenzini G., Nali C., 2012. Principi di Fitoiatria, Edagricole-New Business Media, Bologna, pp. 261. • Battilani P., 2016. Difesa sostenibile delle colture. Principi, sistemi e tecnologie applicate alle Produzioni agricole. Edagricole-New Business Media, Bologna, pp. 308. **Additional readings** • Butturini A., Galassi T., 2014. Difesa fitosanitaria in produzione integrata. Manuale dei metodi e delle tecniche a basso impatto.

	Edagricole-New Business Media, Bologna, pp. 397. • Atti Giornate Fitopatologiche, 2010-2016. • Further materials will be provided on request by the teacher.
Notes	**Examples of websites** http://agricoltura.regione.emilia-romagna.it/fitosanitario/doc/prodotti-fitosanitari/Manuale-basso-impatto http://fitogest.imagelinenetwork.com http://www.frac.info http://eppo.org http://www.fao.org.info http://www.ecpa.be http://www.biopuglia.iamb.it http://www.accredia.it http://www.globalgap.org http://ipm.ucanr.edu/DISEASE/DATABASE/diseasemodeldatabase.html
Teaching methods	Oral presentation supported by Power Point slides, web sites and multimedia, by the usage of blackboard, documents prepared by the teacher and practical exercises in the classroom and in the laboratory.
Assessment methods (indicate at least the type written, oral, other)	Only the students enrolled in the academic year during which this discipline is offered, can have an intermediary exam during the teaching period of the discipline. The result of this intermediary exam remains valid for the whole academic year and concurs to the final evaluation of the student. The intermediary exam will be given on the subjects treated during the lessons and the practical activities as reported in the Didactic Regulation of the Bachelor course (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period. The evaluation of the intermediary exam is expressed in thirtieths. At the end of the module teaching period, the students, who passed positively the intermediary exam, can give the final exam concerning on the subjects treated during the lessons and the practical activities since the intermediary exam, as reported in the Didactic Regulation of the Bachelor Course (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period. Students who did not pass or give the intermediary exam will be examined on the whole subjects treated during the lessons and the practical activities as reported in the Didactic Regulation of the Bachelor course (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period. The intermediary and the final exams consist of an oral test. The evaluation of the student is based on criteria previously fixed such as reported in the Annex A of the Didactic Regulation in Plant Medicine. The exam for foreign students can be given in English according to the above reported modalities.
Evaluation criteria	• *Knowledge and comprehension ability* o Ability to describe the principles, methods and tools for plant protection from diseases. o Ability to describe the European and National regulations on plant protection products.

	○ Ability to describe the fungicides and their modes of action and resistance. ○ Ability to describe the phenomenon of acquired fungicide resistance. • *Knowledge and applied comprehension ability* ○ Ability to define appropriate protection strategies for Mediterranean crops. ○ Ability to define suitable strategies for preventing or managing fungicide resistance. • *Autonomy of judgement* ○ Ability to describe benefits, risks and negative side effects of crop protection strategies. ○ Ability to adapt general roles to specific crops and situations. • *Communication skills* ○ Ability to explain in exhaustive way, with appropriate words, richness of conceptual connections and examples, the principles, methods and tools for crop protection, the Regulations on plant protection products, fungicides and their mode of action, fungicide resistance, sustainable protection strategies for Mediterranean crops. ○ Ability to organize the acquired knowledge in form of didactic presentation and to articulate it for didactic purposes • *Learning ability* ○ Ability to apply acquired knowledge and skills for problem solving in various operative situations.
Further information	Visiting hours From Monday to Wednesday, 9.00 to 13.30 following an established appointment requested by phone or e-mail.

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