

General Information	
Academic subject	<b>Chemistry and Biochemistry of Pesticides (module of I.C. Plant Protection)</b>
Degree course	<b>Master Course in Plant Medicine (LM69)</b>
Curriculum	
ECTS credits	3
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	<b>Matteo SPAGNUOLO</b>	matteo.spagnuolo@uniba.it	Agr 13

ECTS credits details			
Basic teaching activities	Plant Protection disciplines		

Class schedule	
Period	First semester
Year	Second year
Type of class	Lectures, 2 ECTS (16 hours) Laboratory and field classroom 1 ECTS (14 hours)

Time management	
Hours	75
In-class study hours	30 (16 Lectures + 14 Lab & field cl.)
Out-of-class study hours	45

Academic calendar	
Class begins	October 2, 2017
Class ends	January 26, 2018

Syllabus	
Prerequisites/requirements	
Expected learning outcomes	<ul style="list-style-type: none"> <li>• <i>Knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ Knowledge about the composition and properties of pesticides and their mechanism of action in the biochemical pathways of target organisms.</li> <li>○ Knowledge on the pesticide interaction with plant and the environment.</li> <li>○ Knowledge of the Italian and European legislation on pesticides.</li> </ul> </li> <li>• <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ Ability to apply the legislation on the use and commercialization of plant protection products.</li> <li>○ The student will acquire the competence for a sustainable use of pesticides in crop protection for reducing their environmental impact and for obtaining safe agricultural products.</li> </ul> </li> <li>• <i>Making informed judgements and choices</i> <ul style="list-style-type: none"> <li>○ Analytical and problem solving skills to independently analyze different technical and market situations in terms of sustainable use of pesticides.</li> </ul> </li> <li>• <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ Ability to relate to other subjects in a multidisciplinary way on technical, human and ethical issues.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>• <i>Capacities to continue learning</i> <ul style="list-style-type: none"> <li>○ Ability to use cognitive tools such as the information technology (IT) and the English language for the continuing self-education.</li> </ul> </li> </ul>
Contents	<p>Registration of pesticides. Principles of toxicology: toxicity towards humans and the environment. Formulation of pesticides. Chemical and functional classification.</p> <p>Mechanisms of action of pesticides. Transport and accumulation of pesticides in plant. Influence of physical-chemical properties on the absorption and translocation of pesticides in plant. Absorption, translocation and mechanisms of action of insecticides. Absorption, translocation and mechanisms of action of herbicides.</p> <p>Methabolism of pesticides in plant. Detoxification reactions: red-ox, hydrolysis, coniugation, role of glutathione, glucose and amino acids. Resistance and selectivity of pesticides.</p> <p>Fate of pesticides in soil. Diffusion, volatilization and mass transfer. Adsorption of soil components. Transformation: persistence, phototransformation, chemical degradation, microbial and enzymatic degradation, polymerization, oxidative coupling. Chemical and biotechnological processes of soil remediation. Sorption isotherms and analysis of pesticides in soil. Analytical methods for the determination of pesticide residues. Ecotoxicological assessment of pesticides.</p>
Course program	
Bibliography	<p>Notes of the lectures distributed during the course.</p> <p>Gennari M., Trevisan M., 2008 - Agrofarmaci. Conoscenze per un uso sostenibile. Gruppo Perdisa Editore/Airplane s.r.l. Bologna.</p> <p>Muccinelli M., 2011 - Prontuario degli Agrofarmaci. Il Sole 24ore Edagricole. Bologna</p>
Notes	
Teaching methods	Lectures will be presented through PC assisted tools (PowerPoint, Adobe Acrobat, etc.).
Assessment methods	<p>A mid-term exam will be held for active students. It will be an oral exam. The maximum grade will be thirty and the minimum for passing the mid-term exam is eighteen. The mid-term grade contribute in the same way with the final exam for the whole grade and will be valid for the whole academic year.</p> <p>The final exam, as well as the mid-term exam, consists of an oral test with questions related to the program such as reported in the Didactic Regulation in Plant Medicine (art.9) and in the syllabus (annex A).</p> <p>The student evaluation is obtained by using preset criteria, as reported in the Annex A of the Didactic Guidelines of the Master Degree in Plant Medicine.</p> <p>The final grade will be obtained by averaging that of the mid-term, when possible. The maximum grade is thirty.</p>
Evaluation criteria	<ul style="list-style-type: none"> <li>• <i>Knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ Good knowledge about the composition and properties of pesticides and their mechanism of action in the biochemical pathways of target organisms.</li> <li>○ Deep knowledge on the pesticide interaction with plant and the environment.</li> <li>○ Good knowledge of the Italian and European legislation on pesticides,</li> </ul> </li> <li>• <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ Very good ability to apply the legislation on the use and</li> </ul> </li> </ul>

	<p>commercialization of plant protection products.</p> <ul style="list-style-type: none"> <li>○ The student will acquire a very good competence for a sustainable use of pesticides in crop protection for reducing their environmental impact and for obtaining safe agricultural products.</li> <li>● <i>Making informed judgements and choices</i> <ul style="list-style-type: none"> <li>○ Good analytical and problem solving skills to independently analyze different technical and market situations in terms of sustainable use of pesticides.</li> </ul> </li> <li>● <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ Good ability to relate to other subjects in a multidisciplinary way on technical, human and ethical issues.</li> </ul> </li> <li>● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> <li>○ Ability to use cognitive tools such as the information technology (IT) and the English language for the continuing self-education.</li> </ul> </li> </ul>
Further information	<p><b>Visiting hours</b>  <a href="#">All afternoons by previous agreement.</a></p>