

MOLECULAR DIAGNOSTICS

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	CROP SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	CRS 806	SEMESTER OF STUDIES	8 th
COURSE TITLE	Molecular Diagnostics		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
	Lectures	3	
	Tutorials	1	
	Total	4	5
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialized general knowledge, skills development		
PREREQUISITE COURSES:	Typically, there are no prerequisite courses		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Teaching may be performed in English in case foreign students attend the course.		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (English)		
COURSE WEBPAGE (URL)			

2. LEARNING OUTCOMES

<p>Learning outcomes</p> <ul style="list-style-type: none"> • Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area • Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B • Guidelines for writing Learning Outcomes 															
<p>By the end of this course the student will have developed the following skills:</p> <ul style="list-style-type: none"> - Know basic molecular techniques and link them to everyday practice. - Deep knowledge of molecular analysis, sampling, different approaches and scale sizes - Understand, use and maintenance of basic equipment and consumables for molecular analysis techniques. 															
<p>General Competences</p> <p><i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <table border="0"> <tr> <td><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td><i>Project planning and management</i></td> </tr> <tr> <td><i>Adapting to new situations</i></td> <td><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td><i>Decision-making</i></td> <td><i>Respect for the natural environment</i></td> </tr> <tr> <td><i>Working independently</i></td> <td><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td><i>Team work</i></td> <td><i>Criticism and self-criticism</i></td> </tr> <tr> <td><i>Working in an international environment</i></td> <td><i>Production of free, creative and inductive thinking</i></td> </tr> <tr> <td><i>Working in an interdisciplinary environment</i></td> <td><i>.....</i></td> </tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>
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<i>Production of new research ideas</i>	<i>Others...</i>
<ul style="list-style-type: none"> • Autonomous (Independent) work • Team work • Project planning and management • Respect for the environment • Adaptation to environmental changes under optimum, suboptimum and extreme conditions. • Production of new research ideas • Promotion of free, creative and inductive thinking 	

3. SYLLABUS

<p>1: Introduction to molecular diagnostics</p> <p>2: Interactions plant – microorganisms and microbial pathogenicity.</p> <p>3: Interactions animals - microorganisms and microbial pathogenicity.</p> <p>4. Genetic markers</p> <p>5: Bioinformatics, data pools and databases</p> <p>6: Introduction to omics technology</p> <p>7. Omic technologies and molecular diagnostics.</p> <p>8: Microbial detection and identification</p> <p>9: Molecular detection quarantine pathogens</p> <p>10: Molecular diagnostics in food science</p> <p>11: Molecular diagnostics of viruses</p> <p>12: Determination of geographical origin for food with molecular techniques</p> <p>13: Biosensor technology and techniques.</p>
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4. TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face lectures in the classroom and laboratory.	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of Information and Communication Technologies (ICTs) in teaching. Scenarios <i>in silico</i> and evaluation of small fruit trees and subtropical trees culture data will be integrated in the course. Exemplary solutions will be provided.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of nondirected study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures (4 conduct hours per week x 13 weeks)	52
	Literature study	52
	Hours for private study of the student, preparation and attendance mid-term or/and final examinations.	21

	Total number of hours for the Course (25 hours of work-load per ECTS credit)	125 hours (total student work-load)
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	A written examination with development questions and/or multiple-choice questions or problem-solving as well as questions based on laboratory exercises, unless the student participated in semester progress, so the above applies. Minimum pass mark: 5 (full scale: 0-10)	

5. ATTACHED BIBLIOGRAPHY

<p><i>Proposed literature</i> (indicative and not restrictive):</p> <ol style="list-style-type: none"> 1. Diagnostic Microbiology, 15th Edition, Bailey & Scott, Elsevier 2. Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications, Lela Buckingham 3. Molecular Techniques in Food Biology: Safety, Biotechnology, Authenticity and Traceability Aly Farag El Sheikha (Editor), Robert E. Levin (Editor), Jianping Xu (Editor) 4. The Use of Molecular Biology Techniques in Food Traceability. M. Espiñeira, F.J.Santaclara
