

COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	AGR_405	SEMESTER OF STUDIES	FIFTH
COURSE TITLE	AGRICULTURAL ENTOMOLOGY		
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	
Laboratory exercises		2	
Total		5	5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Mandatory, special background, specialised general knowledge, skills development		
PREREQUISITE COURSES:	Typically, there are no prerequisite courses.		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. The course may be given in English in case foreign student follow.		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)			

2. LEARNING OUTCOMES

Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i> <i>Consult Appendix A</i> <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>At the end of this course the student will further develop the following skills:</p> <ol style="list-style-type: none"> 1. Have acquired the basics on the status of insect species within the Animal Kingdom and their role in the environment and agriculture in particular, the organization, form and diversity of species of the entomological fauna. 2. Be familiar with the basic morphology, anatomy, physiology and systematic classification of insects. 3. Be familiar with the symptoms of insect attack induced on crop plants, stored agricultural products, food and / or livestock. 4. Have acquired management skills for insect pest species and beneficial species in relation to agriculture and the environment in general. 5. Be familiar with basic laboratory entomology techniques (processing of fresh samples of infested plants [study of symptoms, stereoscopy, microscope], diagnostic procedure)
General Competences <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> <i>Search for, analysis and synthesis of data and</i> <i>Project planning and management</i>

<i>information, with the use of the necessary technology</i>	<i>Respect for difference and multiculturalism</i>
<i>Adapting to new situations</i>	<i>Respect for the natural environment</i>
<i>Decision-making</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Working independently</i>	<i>Criticism and self-criticism</i>
<i>Team work</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an international environment</i>	<i>.....</i>
<i>Working in an interdisciplinary environment</i>	<i>Others...</i>
<i>Production of new research ideas</i>	<i>.....</i>

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):

Decision making
Autonomous (Independent) work
Team work
Respect for the Environment
Promotion of free, creative and inductive thinking

3. SYLLABUS

1. Divisions of entomology, particular importance of agricultural-applied entomology.
2. Systematic entomology, nomenclature, classification. Phylogenetic origin of insects, insect evolution and biogeography. Insect societies.
3. Insect morphology.
4. Anatomy - Physiology: Digestive, circulatory, excretory system.
5. Anatomy - Physiology: Respiratory, muscular system (movement of insects).
6. Anatomy - Physiology: Nervous system. Senses.
7. Anatomy - Physiology: Reproductive system. Life cycle. Embryonic and transcutaneous growth. Transformations.
8. Seasonal development and diapause.
9. Class Insecta: subdivisions. Classification of insects in orders.
10. Description, biology, ethology of important insect pests of plants.
11. Principles of insect control of agricultural importance and other harmful insects per order.
12. Beneficial insect species. Natural insect enemies and entomopathogenic microorganisms.
13. Insects and global changes in climate and trade.

Laboratory exercises:

1. Health and safety rules in the laboratory.
2. Morphology of various parts of the insect body.
3. Identification of the juvenile and adult life stages of holometabolan species of the most important insect orders and main families of agricultural and sanitary significance.
4. Identification of the juvenile and adult life stages of hemimetabolan species of the most important insect orders and main families of agricultural and sanitary significance.
5. Identification of the juvenile and adult life forms of ametabolan species of the most important insect orders and main families of agricultural and sanitary significance.
6. Recognition of the main categories of symptoms / insect pests on crops, stored agricultural products, food and livestock.

4. TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Lectures in class and laboratory exercises in the lab, face to face.	
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) (e.g. powerpoint) in teaching. The contents of the course of each chapter are uploaded on the internet, in the form of a series of pdf files that the students can freely download using a password which is provided to them at the beginning of the course.	
TEACHING METHODS	Δραστηριότητα	Φόρτος Εργασίας Εξαμήνου

<p><i>The manner and methods of teaching are described in detail.</i></p> <p><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></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	Lectures (3 conduct hours per week x 13 weeks)	39
	Laboratory work (2 conduct hours per week x 6 weeks)	12
	Assignment	12
	Hours for private study of the student, preparation and attendance mid-term or/and final examinations.	62
	Total number of hours for the Course (25 hours of work-load per ECTS credit)	125 hours (total student work-load)
<p>STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><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></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ol style="list-style-type: none"> 1. Mandatory written examination, with full length questions and / or multiple choice questions, as well as questions based on the laboratory work. Minimum pass grade= 5, scale 0-10. Total degree contribution 80%. 2. Mandatory assignment, maximum evaluation degree = 2. Total degree contribution 20%. 3. Final degree = sum 1+2. 4. All the above are taking place in Greek and/or in English in case foreign student follow. 	

5. RECOMMENDED LITERATURE

Suggested bibliography:

1. Hill D.S. 2009. Agricultural Entomology. Timber Press
2. Nation J.L. 2011. Insect Physiology and Biochemistry, Second Edition - CRC Press Book
3. Gilbert L.I., Sarjeet S.G. 2010. Insect Control Biological and Synthetic Agents. Academic Press. Elsevier.

- Related academic journals:

1. Entomologia Hellenica. Hellenic Entomological Society.
2. Agricultural and Forest Entomology. Wiley-Blackwell on behalf of the Royal Entomological Society of London.