

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>DEPARTMENT</b>	FOOD SCIENCE AND TECHNOLOGY		
<b>LEVEL OF COURSE</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	<b>FST_X07</b>	<b>SEMESTER OF STUDIES</b>	WINTER
<b>COURSE TITLE</b>	ENEMIES OF STORED PRODUCTS		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <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>	<b>WEEKLY TEACHING HOURS</b>	<b>ECTS CREDITS</b>	
Lectures	3		
Exercises	2		
<b>Total</b>	<b>5</b>	<b>5</b>	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Elective Course Specialized general knowledge		
<b>PREREQUISITE COURSES:</b>	There are no prerequisite courses		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	No		
<b>COURSE WEBPAGE (URL)</b>	<a href="https://eclass.upatras.gr/">https://eclass.upatras.gr/</a>		

### 2. LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><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></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>The learning outcomes upon successful completion of the specific course will contribute so that students can:</p> <ul style="list-style-type: none"> <li>• Recognize the most important entomological enemies of stored products</li> <li>• Become familiar with the biology, ecology and behavior of animal pests that attack agricultural products after harvest</li> <li>• Become familiar with the biology, ecology and behavior of insects and mites of sanitary importance</li> <li>• Use and choose the appropriate methods of combating the enemies of the stored products</li> </ul>

- Evaluate the qualitative and quantitative losses caused.

### General Competences

*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>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>
<i>Adapting to new situations</i>	<i>Adapting to new situations</i>
<i>Decision-making</i>	<i>Decision-making</i>
<i>Working independently</i>	<i>Working independently</i>
<i>Team work</i>	<i>Team work</i>
<i>Working in an international environment</i>	<i>Working in an international environment</i>
<i>Working in an interdisciplinary environment</i>	<i>Working in an interdisciplinary environment</i>
<i>Production of new research ideas</i>	<i>Production of new research ideas</i>

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision making
- Working independently
- Teamwork
- Promotion of free, creative and inductive thinking

### 3.SYLLABUS

1. Morphology, biology, ecology of enemies of stored products.
2. Determination of the presence / infestation by animal enemies, factors affecting the infestation by animal enemies of the stored products.
3. Methods and means of dealing with animal pests affecting agricultural products after harvest.
4. Fighting animal enemies in warehouses, insecticides, disinfestations.
5. Effectiveness of insecticides, fumigation insecticides, biological and other methods. Warehouse insects (Coleoptera, Lepidoptera, Dictyoptera, Thysanura, Psocoptera), Mites. Allergies and other effects from warehouse insects.
6. Nutrient value data of plant products and their losses during fresh storage. Physiology and quality data of stored grains and nuts.
7. Storage of grains and nuts: storage conditions and quality and quantity losses. Physiology and quality data of harvested fresh fruits and vegetables. Quality assessment of fresh fruit and vegetables. Preservation of fresh fruits and vegetables, conditions and quality losses. Modified or controlled atmosphere during maintenance.

Laboratory practice:

Laboratory exercises include the following:

1. Identification of the main species of beetles in stored agricultural products and food
2. Identification of the main species of wood-eating insects
3. Use of warehouse climatic parameters measuring instruments and psychrometric map
4. Quality assessment of stored products

### 4.TEACHING AND LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face-to-face
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. Communication with students: through e-mail, department's website and platform e-class. The lectures content of the course for each chapter are uploaded on the internet, in the form of a series of .pdf files, where students can freely download them from the platform e-class.upatras.gr

<b>TEACHING METHODS</b>	<b>Activities</b>	<b>Work Load per semester</b>
<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 hours per week x 13 weeks)	39
	Study and Literature Analysis	50
	Laboratory practice	20
	Laboratory essay writing	16
	<b>Total number of hours for the Course (25 hours of work-load per ECTS credit)</b>	<b>125</b>
	<p><b>STUDENT PERFORMANCE EVALUATION</b></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>	<p>Language of evaluation: GREEK</p> <p>Written examination after the end of the semester (100%) including:</p> <ul style="list-style-type: none"> <li>• Multiple-choice questions</li> <li>• Short-answer questions</li> <li>• Open-ended questions</li> <li>• Evaluation of laboratory works</li> </ul> <p>Grading scale: 1 to 10. Minimum passing grade: 5. Examination time: 3 hours.</p>

## 5. ATTACHED BIBLIOGRAPHY

### Suggested Bibliography:

1. Diptera of sanitary importance, 1999, N.G. Emmanuel
2. Insects of stored agricultural products and food, 1996, K.Th. Buchelos
3. Milt. D. Vasilakakis, Postharvest Physiology, Fruit and Vegetable Treatment and Technology, Ed. Gartagani, Thessaloniki, 2006
4. Stamopoulos D. K., Enemies of stored products, museums and homes, University Press of Thessaly
5. Bouhelos K. Th., Wood-eating Household Insects - Treatment, Biology, Identification, Agrotypes SA

### Related scientific journals:

1. Journal of Stored Products Research
2. Journal of Insect Science
3. Journal of Pest Science
4. Journal of Food Protection