

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Agricultural Sciences		
ACADEMIC UNIT	Biosystems & Agricultural Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	BAE 805	SEMESTER	8 th
COURSE TITLE	ENVIRONMENTAL CONTROL OF AGRICULTURAL STRUCTURES		
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	2		
Laboratory			
TOTAL	5	5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	General Background Specialised general knowledge		
PREREQUISITE COURSES:	There are no prerequisite courses.		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek .-For Erasmus students in English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes</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"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications The course offers specialized knowledge in the field of control and regulation of the artificial environment: (1) housing areas for farm animals, (2) ventilated warehouses and (3) cold rooms. It also offers problem-solving skills such as energy and mass balances, calculations of the required ventilation benefits, regulation of the artificial environment, synergy of ventilation-heating-cooling systems, selection of fans and required equipment for the regulation of temperature and humidity in the housing areas of farm animals, ventilated warehouses and cold rooms. Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 								
<p>The student who successfully completes the course will have the ability to recognize and analyze basic machine elements for connecting objects, analyze simple mechanical constructions of rotary movement and identify critical operating and wear positions of mechanisms. You will acquire skills related to the recognition and operation of mechanisms related to agricultural machinery and mechanisms for cutting plant materials</p>								
<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 style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"><i>Adapting to new situations</i></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td style="border: none;"><i>Decision-making</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</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>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
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<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>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>Working in an interdisciplinary environment</i>	<i>Others ...</i>
<i>Production of new research ideas</i>

At the end of this course the student will have further developed the following general skills:
Search, analysis and synthesis of data and information, using the necessary technologies
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Respect for the natural environment
Exercise criticism and self-criticism

(3) SYLLABUS

<ol style="list-style-type: none"> 1. General about rural buildings. 2. Exchanges of energy and mass between rural building and environment (balances). 3. Heat protection, moisture protection. 4. Construction materials and properties. 5. Psychrometric procedures in agricultural buildings (stables, warehouses, cold rooms). 6. Cooling, refrigeration systems. 7. Heating systems. 8. Ventilation, calculations. Choice of fans. Air flow fields for each building. 9. Combination of ventilation systems with heating/cooling and humidification systems. 10. Calculations of thermal loads in stables. 11. Calculations of thermal loads in ventilated warehouses. 12. Calculations of thermal loads in cold rooms. 13. Mechanical equipment to achieve desired environmental conditions in a farm building.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face deliveries.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Use of ICT (power point) in Teaching • Use of ICT (power point) in Laboratory Training • Use of ICT in Communication with students (Learning process support through the electronic platform e-class). 	
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 non directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	39
	Tutorials	20
	Project work	21
	Study hours and preparation for the laboratory exercises and the final examination	45
	Course total	125
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple</i>	<ol style="list-style-type: none"> 2. The main assessment criteria focus on understanding and correlating the knowledge that students gain from the course with other knowledge. Particular emphasis is placed on whether they have developed the ability to apply this knowledge to crop selection and to assess the impact of these changes on the environment. Emphasis is also placed on demonstrating critical ability and justifying the choices they make in each problem. 	

<p><i>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> Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	<p>3. Evaluation is dynamic. It mainly involves problem solving. is done orally or in writing or with a combination of the two, with or without pre-examination on the basic principles of the course, with or without exculpatory advances and with other test or inventive methods, depending on the composition of the dynamics and the needs of the audience.</p> <p>4. The above are done in the Greek language. For foreign language students (eg Erasmus students) conducted in English</p>
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(5) RECOMMENDED LITERATURE in Greek

Suggested bibliography:

- 1. The Mechanics and Physics of Modern Grain Aeration Management. Ed. Shlomo Navarro and Ronald Noyes, CRC Press 2001, ISBN: 978-1-4200-4033-3.
- 2. Engineering for Storage of Fruits and Vegetables, 1st Ed. Cold Storage, Controlled Atmosphere Storage, Modified
- 3. Atmosphere Storage. Chandra Gopala Rao, Elsevier 2015, ISBN: 978-0-12-803365-4.
- 4. Environment Control for Animals and Plants. Albright, L. D. St. Joseph, Mich.: ASAE, 1990.

