

## COURSE OUTLINE

### 1. GENERAL

<b>SCHOOL</b>	AGRICULTURAL SCIENCES		
<b>ACADEMIC UNIT</b>	AGRICULTURE		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	AGR_710	<b>SEMESTER OF STUDIES</b>	7 <sup>th</sup>
<b>COURSE TITLE</b>	Intelligent Agriculture		
<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>CREDITS</b>	
Lectures	3	5	
Laboratory course	2		
Total	5		
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	general background, specialised general knowledge, skills development		
<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>	-		
<b>COURSE WEBPAGE (URL)</b>			

### 2. LEARNING OUTCOMES

<p><b>Learning outcomes</b>  <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>            Consult Appendix A</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>Upon completion of the course students will:</p> <ul style="list-style-type: none"> <li>- Have been introduced to the basic principles of intelligent agriculture and the Internet of Things (IoT)</li> <li>- They will have a comprehensive understanding of how the agricultural sector will become upgraded through education in innovation and integration of the agricultural sector into the new conditions</li> <li>- Knowledge of advanced IT technologies related to Intelligent Internet Applications in the field of agriculture</li> </ul>			
<p><b>General Competences</b>  <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>  <i>Adapting to new situations</i>  <i>Decision-making</i>  <i>Working independently</i>  <i>Teamwork</i>  <i>Working in an international environment</i> </td> <td style="width: 50%; border: none;"> <i>Project planning and management</i>  <i>Respect for difference and multiculturalism</i>  <i>Respect for the natural environment</i>  <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>  <i>Criticism and self-criticism</i>  <i>Production of free, creative and inductive thinking</i>            .....         </td> </tr> </table>		<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>Decision-making</i> <i>Working independently</i> <i>Teamwork</i> <i>Working in an international environment</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> .....
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<i>Working in an interdisciplinary environment</i>	<i>Others...</i>
<i>Production of new research ideas</i>	<i>.....</i>
<p>Upon completion of this course the student will have further developed the following general competencies:</p> <ul style="list-style-type: none"> <li>- Search, analyze and synthesize data and information using the necessary technologies</li> <li>- Adaptation to new situations.</li> <li>- Working in an interdisciplinary environment</li> <li>- Decision-making.</li> <li>- Project planning and management</li> <li>- Working independently</li> <li>- Team work</li> </ul>	

### 3. SYLLABUS

#### Theoretical part:

1. Introduction to Intelligent Agriculture. Integrated approach to managing agricultural activity. Utilizing modern technologies. Digital transformation of the agricultural sector. Input control
2. Modern Digital Information and Communication Technologies and planned methods of data collection, processing, storage and dissemination. Outdoors broadband.
3. Internet of Things (IoT). BigData analysis. Satellite monitoring of the earth. The Future of IoT: Requirements, Architecture, 5G Generation Infrastructure and Applications
4. Factors of production (soil / climate, labor, capital - inputs, management). Rural productivity. Sustainable agriculture-environment relationship.
5. Automatic Control Systems and Process Configuration. New technologies in fertilization, irrigation and plant protection
6. Greenhouse climate control and farm units
7. Nutrition Control in Hydroponic Crops
8. Telematic Management of Irrigation Networks
9. Meteorological applications and data exploitation
10. Internet applications
11. Applications of Artificial Intelligence. Robotics. Development of Multimedia Applications
12. Research & Development of "Good Practices" for Certification
13. Input - Output of energy. Reduced use of negative impacts on the environment to meet the objectives of agriculture and livestock breeding.

#### Laboratory part

1. Data collection and analysis methods. Organize data for analytical processing
2. Analysis, design and architecture of web applications
3. IoT and software: Operating systems for limited resources devices (Contiki, TinyOS) and IoT application protocols
4. Big Data, cloud computing and data centers
5. Key features of SDN networks
6. Research methodology. Developing skills in writing scientific papers and technical reports
7. Presentation of scientific and technical work

### 4. TEACHING AND LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face to face lectures.	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT (powerpoint) and panel in teaching. Methodology	
<b>TEACHING METHODS</b> <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</i>	<b>Activity</b>	<b>Semester workload</b>
	Lectures (3 contact hours per week x 13 weeks)	39
	Laboratory course (2 contact hours per week x 7 weeks) with personal reports	14
	Final examination (3 contact hours)	3

<p><i>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>	Study hours, preparation for the lab and preparation for the final exams	69
	Course total	<b>125 hours total workload</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>	<ol style="list-style-type: none"> <li>1. Course attendance - Participation in the classroom</li> <li>2. Presentation of research work in the laboratory</li> <li>3. Final written examination of all the material with multiple choice, right-wrong, and short development questions to be used for overall student assessment in conjunction with the laboratory exercises. Minimum passing grade: 5.</li> <li>4. All the above are taking place in Greek.</li> </ol>	

## 5. ATTACHED BIBLIOGRAPHY

-Κινγκ Ροβέρτος, Ευφυής έλεγχος, ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε. 2004. ISBN:978-960-418-041-7.

-Bentley John P. Συστήματα μετρήσεων, Βασικές αρχές. Εκδόσεις Ίων, (Διαθέτης ΣΤΕΛΛΑ ΠΑΡΙΚΟΥ & ΣΙΑ ΟΕ) 2009. ISBN: 978-960-411-700-0

-ΛΑΖΑΡΟΣ Σ. ΗΛΙΑΔΗΣ. ΕΥΦΥΗ ΠΛΗΡΟΦΟΡΙΑΚΑ ΣΥΣΤΗΜΑΤΑ ΚΑΙ ΕΦΑΡΜΟΓΕΣ ΣΤΗΝ ΕΚΤΙΜΗΣΗ ΚΙΝΔΥΝΟΥ. Εκδόσεις ΣΤΑΜΟΥΛΗΣ ΑΝΤ. 2007. ISBN: 978-960-6741-33-3