COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**FST_X01**	**SEMESTER**	Spring
COURSE TITLE	Precision Agriculture		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	3	
Seminars	1	
		5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Elective Specialized general knowledge Field of Science (Biological Agriculture and Bio Foods)
PREREQUISITE COURSES:	There are no prerequisite courses
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.upatras.gr/

2. LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *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*

This course syllabus intends to enable students to better understand the processes of collecting, analyzing and intergrading field data by using modern technology applications in order to be used for the efficient use of nutrients and herbicides as well as the precise use of irrigation water.

The main objective of the course is to develop student's ability to use spatial analysis for decision making in rural farming.

At the end of this course students will be able to:

- Gather knowledge that involves critical understanding of the theories and principles such as Precision Agriculture, spatial variability and

subsectors of the farm, crop efficiency, the use of agricultural technology in farm management, the use of global positioning system (GPS), geographic information system (GIS), sensors and controllers as tools for precision farming.

- Develop knowledge-based skills which are required for the further study with a high degree of autonomy.
- Gather knowledge about how tools and techniques of Precision Agriculture, can be applied in decision making.
- Use technology, by combining knowledge and information from natural sciences such as agriculture, biology and soil science, and social sciences such as economics and politics to provide environmental and economic benefits.
- Communicate information, ideas, problems and solutions to both qualified and non-specialized audiences and work with fellow students to create and present a precise farming plan by using reduced inputs, soil quality indicators, precise use of irrigation water, and eventually to compose and apply a precision agriculture program on farms.

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

By the end of this course the student will, furthermore, have developed the following skills (general abilities):
Autonomous work
Decision making on farm management
Teamwork
Respect for the natural environment
Working in an interdisciplinary environment
Project design and management
Producing new research ideas

3. COURSE CONTENT

- Definition of Precision Agriculture
- Precision Agriculture tools:
  GPS, GIS, Sensors and controllers, meteorological control system on farming land, soil moisture monitoring system and concentration of nutrients in the soil.
- Procedures of Precision Agriculture:
  Data collection, spatial analysis, interpretation of results and decision making.
- Geodetic concepts and mapping principles
- The importance of mathematics in agriculture
- Data analysis and management tools, interpretive techniques

- Efficiency of Precision Agriculture

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	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
TEACHING METHODS *The manner and methods of teaching are described in detail. 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.* *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*	<table><tr><th>***Activity***</th><th>***Semester workload***</th></tr><tr><td>Lectures (3 hours per week x 13 weeks)</td><td>39</td></tr><tr><td>Seminars (1 hour per week x13)</td><td>13</td></tr><tr><td>Developing a project on the transition from conventional to organic farming</td><td>25</td></tr><tr><td>Final examination (3 hours)</td><td>3</td></tr><tr><td>Non-guided study</td><td>45</td></tr><tr><td>***Total number of hours for the Course (25 hours of work-load per ECTS credit)***</td><td>***125***</td></tr></table>
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *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* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Written examination after the end of the semester (100%) including: • Multiple-choice questions • Benchmarking theory elements I. Written final exam (70%) comprising: - Short answer questions or multiple-choice questions - Solving problems related to organic products - Comparative evaluation of the theory II. Presentation of teamwork (30%) - Delivering written works and public presentation by Working Groups Grading scale: 1 to 10. Minimum passing grade: 5. Examination time: 3 hours.

5. RECOMMENDED LITERATURE

1. Fountas S., Gemtos T., 2015. Precision Agriculture. http://hdl.handle.net/11419/2670
2. Brase T., 2009. Precision Agriculture.