PRECITION AGRICULTURE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	CROP SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	CRS_807	**SEMESTER OF STUDIES**	8th
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	
Tutorial	1	
Total	4	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	*general background*, Specialised general knowledge, *skills development*
PREREQUISITE COURSES:	Typically, there are no prerequisite courses. Students should have basic knowledge of soil science and statistics
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Teaching may be performed in English in case foreign students attend the course.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (English)
COURSE WEBPAGE (URL)	

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 aims to provide students with basic knowledge to precision agriculture. By the end of this course the student will be able to:

Understand plots spatial and temporal variability and select appropriate method and technologies for their management.

Select appropriate equipment's for measure variability and variable rates.

Estimates the economical contribution of Precision Agriculture.

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
Adapting to new situations
Decision-making
Working independently
Teamwork
Working in an international environment
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking

Working in an interdisciplinary environment *Production of new research ideas*	*……* *Others…* *…….*

Searching, analysis and synthesis of facts and information, as well as using the necessary technologies
Decision making
Respect for the natural environment
Working independently
Promotion of free, creative and inductive thinking

3. SYLLABUS

1. Introduction to variation. Spatial varietion
2. Spatio-temporal variation of soil and crop properties and characteristics and other farm parameters
3. Principles and method of precision agriculture management.
4. Methods and applications of mapping crop characteristics
5. Global positioning, navigation systems (GNSS)
6. Production mapping system
7. Soil and crop monitoring sensors
8. Remote Sensing for Agricultural Applications
9. Surface modelling and spatial interpolation
10. Precision agriculture data analysis
11. Harvest diversification and low-input farming
12. Sensor Technology in Autonomous Vehicles
13. Applications of precision agriculture in Greece

4. TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face lectures in the classroom.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES *Use of ICT in teaching, laboratory education, communication with students*	Use of Information and Communication Technologies (ICTs) (e.g. Microsoft PowerPoint) in teaching. The contents of the course of each chapter are uploaded on the internet, that the students can freely download using a password which is provided to them at the beginning of the course.
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*	

Activity	***Semester workload***
Lectures (4 contact hours per week x 13 weeks)	52
Projects	16
Individual reports	16
Field trips	14
Hours for private study of the student, preparation and attendance mid-term or/and final examinations.	22
Total number of hours for the Course (25 hours of workload per ECTS credit)	***125 hours (total student workload)***

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*	Optionally, two mid-term examinations, the first in the middle and the second at the end of the semester. The evaluation procedure is conducted with short answer questions and/or open-ended questions and/or multiple choice questionnaires and/or oral examination, as well as questions based on laboratory exercises. The final examination grade is the mean mark. It is mandatory to obtain pass grade (≥5) in each examination.

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. The evaluation procedure is conducted with short answer questions and/or open-ended questions and/or multiple choice questionnaires and/or oral examination, as well as questions based on laboratory exercises (unless the student has successfully participated the mid-term examinations). Minimum passing grade: 5. The above mentioned process will be taking place in Greek and for foreign students (eg ERASMUS students) in English. Examination will be based on full length questions and / or multiple choice questions. Oral examination could take place if permitted by the legal/regulatory framework under which the student is affiliated (or enrolled) to the department. If permitted, oral examination will take place simultaneously with written exams.

5. ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. Φουντάς, Σ., Γέμτος, Θ., 2016. ΓΕΩΡΓΙΑ ΑΚΡΙΒΕΙΑΣ. [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. ISBN: 978-960-603-135-9.
2. Ancha Srinivasan (ed): Handbook of precision agriculture. Principles and applications. The Haworth Press Inc., New York, 683 pp, ISBN-13: 978-1-56022-945-4
3. Allen, R.G., Pereira, S.L., Raes, D. and Smith, M., (1998) Crop Evapotranspiration Guidelines for computing crop water requirements, FAO Irrigation and Drainage Paper 56, FAO, Rome, Italy.
4. Charlesworth, P., (2000) Soil Water Monitoring, CSIRO Land and Water, Australia.
5. Συναφή επιστημονικά περιοδικά:
6. Precision Agriculture