Precision Agriculture Technologies [2226]

COURSE OUTLINE

(1) GENERAL

SCHOOL	ANIMAL BIOSCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDIES	Undergraduate [Free Elective]		
COURSE CODE	2226	**SEMESTER**	7th
COURSE TITLE	PRECISION AGRICULTURE TECHNOLOGIES		

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 (ECTS)**
Lectures and laboratory exercises	5	5
Total	**5**	**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*	Skills Development
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS:	Yes (in English)
COURSE WEBSITE (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*

The outcome of the course is the acquisition of knowledge by the students of the Department of Animal Science in the practical application of precision livestock farming technologies. The course content aims to enable students to understand:

- Description of animal positioning systems using GPS and animal monitoring through remote sensing.
- Recording and monitoring of pastures and grazing lands, along with the assessment of their quality.
- Technologies and systems for monitoring animal behavior.
- Description of methods and systems for precision feeding.
- Systems for the early detection of diseases.
- Optimization of housing/environmental control systems (design and construction of bioclimatic livestock facilities, and the use of sensors and appropriate models for optimal control of environmental conditions).
- Livestock farm management systems, early diagnosis of lameness (lameness detection), systems, sensors, modes of use and application, disease diagnosis, and utilization of results.

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…* .....

- The thirteen (13) laboratory exercises within the framework of the course require both teamwork and independent work.
- The discussion of students' answers to the 13 laboratory exercises takes place before the entire class, thereby fostering critical and self-critical thinking.

(3) SYLLABUS

Precision Agriculture Technologies for Monitoring Grazing Animals

i. Description of animal positioning systems using GPS
ii. Animal monitoring using remote sensing
iii. Recording and monitoring of pastures and grazing lands using remote sensing, including quality assessment
iv. Technologies for monitoring animal behavior
v. Technologies for measuring the weight of grazing animals
vi. Information systems for livestock farm management

Precision Agriculture Technologies in Animal Housing

i. Description of methods and systems for precision feeding
ii. Systems for early disease detection
iii. Optimization of housing systems
iv. Design and construction of bioclimatic livestock facilities, using sensors and appropriate models for optimal environmental control
v. Livestock farm management systems
vi. Early detection of lameness: systems, sensors, methods of use and application, disease diagnosis, and utilization of results

(4) TEACHING and LEARNING METHODS - EVALUATION

TEACHING METHOD *Face-to-face, Distance learning, etc.*	In the classroom
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of PowerPoint slides and video presentations. • Communication with students via e-mail. • Support of the learning process through access to e-class, online databases, etc.
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	39
Laboratory exercises	26
Autonomous study	60
Course total (25 h of workload per ECTS)	***125***

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.*	I. The language of assessment is Greek. II. The grade for the theoretical component is determined 80% or 100% by the final written examination, which includes: a. Essay questions b. Short-answer questions c. Multiple-choice questions and 0–20% by a project presentation. III. The grade for the laboratory component is determined 100% by the final written examination, which includes: a. Essay questions b. Short-answer questions c. Multiple-choice questions

(5) ATTACHED BIBLIOGRAPHY

- Suggested Bibliography:

- Halachmi, I., 2015. *Precision Livestock Farming Applications: Making Sense of Sensors to Support Farm Management*. Wageningen Academic Publishers.
- Fountas, S., & Gemtos, Th., 2015. *Precision Agriculture*. Kallipos, Greek Academic Publications. Ebook.