COURSE OUTLINE

1.GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	**FST_E01**	**SEMESTER OF STUDIES**	Spring
COURSE TITLE	ENVIRONMENTAL & FOOD TOXICOLOGY		

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**	**ECTS CREDITS**
Lectures	3	
Exercises	2	
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*	Elective specialised general knowledge,
PREREQUISITE COURSES:	No.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No.
COURSE WEBPAGE (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*

The course aims to achieve the following learning outcomes. Upon completion of the course, students will be able to:

- distinguish the categories of toxic substances into food endogenous, environmental exogenous and products of interaction of components during the preparation of food and microorganism toxins
- associate toxic substances with the problems they cause to the human body
- evaluate the symptoms and argue in terms of ways to avoid or prevent poisoning
- identify and analyze toxic substances from the various sources of origin

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	*Search for, analysis and synthesis of data and information, with the use of the necessary technology*
Adapting to new situations	*Adapting to new situations*
Decision-making	*Decision-making*
Working independently	*Working independently*
Team work	*Team work*
Working in an international environment	*Working in an international environment*
Working in an interdisciplinary environment	*Working in an interdisciplinary environment*
Production of new research ideas	*Production of new research ideas*

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Production of new research ideas
- Promotion of free, creative and inductive thinking

3.SYLLABUS

Food toxicology. Food safety. Modes and phases of actions of toxic substances. Dose and effect time relationship. Synergism and antagonism of toxic substances. Definition of ADI and NOEL. Toxicological tests. Ways of manifestation of poisoning. Toxicological role of the gastrointestinal tract.
Microorganism toxins. Staphylococci, salmonella, coliform bacteria, botulism, mycotoxins.
Toxic substances from the environment: lead, cadmium, mercury, pesticides.
Ways of exposure of organisms to toxic substances. Analysis of the mechanisms of action of pollution. QSAR Methodology: Description of Mathematical Models for Toxicity Assessment.
Food toxicity: phytic acid, lectins, seafood toxins, hormones, lathyriasis, cyamosis. Toxicity of natural food components: sugars, fats, amino acids, caffeine, alcohol, monosodium glutamate. Antinutritional agents – vitamin antagonists, enzyme inhibitors.
Interaction of drugs and food ingredients.
Toxic substances formed during the processing or preparation of food. Food allergies.

Laboratory part:
Introduction to food toxicology laboratory analyses.
Analysis methods.
Design of the basic parameters of the measurements.
Reference curve.
Determination of toxic substances in food.

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.*	

Activities	*Work Load per semester*
Lectures (3 hours per week x 13 weeks)	39
Exercises (2 hour per week x	26

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*	13 weeks) | Literature study and analysis | 41 Writing reports of laboratory exercises | 16 Final examination (3 hours) | 3 ***Total number of hours for the Course (25 hours of work-load per ECTS credit)*** | **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.*	It is carried out based on the following criteria (combined or not) depending on the number of students who will participate in the course. • Written exam at the end of the semester with development questions, short answer questions and/or multiple choice questions, or a combination of the above • Evaluation of laboratory work Grading scale: 1 to 10. Minimum passing grade: 5. Examination time: 3 hours.

5.**ATTACHED BIBLIOGRAPHY**

1. Γιαγκίνης Κ., Καραντώνης Χ., Γκιαούρης Ε., Σταμάτιος Θ., Βασικές Αρχές Τοξικολογίας: Εισαγωγή στην Τοξικολογία Τροφίμων (in Greek).
2. Βαλαβανίδης Αθ. 2007. Οικοτοξικολογία και Περιβαλλοντική Τοξικολογία. Έκδοση: Τμήμα Χημείας, Πανεπιστήμιο Αθηνών (in Greek).
3. Landis W.G., Yu Ming-Ho. 1995. Introduction to Environmental Toxicology. Lewis Publishers. ISBN 0-87371-515-2.
4. Walker C. et all. 1996. Principles of Ecotoxicology. Taylor & Francis Publishers. ISBN 0-7484-0221-7.
5. Κωνσταντίνος Σ. Σφλώμος, Χημεία Τροφίμων με Στοιχεία Διατροφής, Τόμος 1, Χημεία Τροφίμων, Αθήνα 2011 (in Greek).
6. Γαλανοπούλου Ν., Διατροφή και Χημεία Τροφίμων, 2007 (in Greek).
7. Tu A.T.: Handbook of Natural Toxins, Colorado St. Univ., Marcel Dekker Inc., NY, 1992.
8. Botsoglou N. and Fletouris D.: Drug residues in foods, Aristotle Univ. of Thessaloniki, Marcel Dekker Inc., 2000.
9. Breneman C.J.: Handbook of food allergies. Marcel Dekker Inc., NY, 1986.
10. Hathcock H.J.: Nutritional toxicology (vol. 1). London Academic Press, 1982.
11. Environmental Toxicology (Wiley - Edited By: PAUL B. TCHOUNWOU).