COURSE OUTLINE

1.GENERAL

SCHOOL	AGRICULTURAL SCIENCE		
DEPARTMENT	FOOD SCIENCE AND TECNOLOGY		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	**FST_302**	**SEMESTER OF STUDIES**	3rd
COURSE TITLE	**Principles of Food Biotechnology**		

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*	Compulsory-Special background
PREREQUISITE COURSES:	There are no prerequisite courses.
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*

Upon successful completion of the course, students will be able to:

- understand the main principles of Food Biotechnology
- describe basic concepts related to molecular biology, biotechnology including genomic, proteomics, transcriptomics and metagenomic applications.
- understand the use of microorganisms in biotechnology along with their opportunities for industrial and commercial exploitation
- recognize main examples of genetically modified foods
- describe National and European legislation on food production through genetic modification techniques

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	
Adapting to new situations	
Decision-making	
Working independently	
Team work	
Working in an international environment	
Working in an interdisciplinary environment	
Production of new research ideas	

3.SYLLABUS

Lectures

- Introduction to Food Biotechnology
- Structure and properties of DNA
- DNA replication, transcription. RNA translation. Post-translational protein modifications
- Recombinant DNA technology. Restriction enzymes. DNA cloning vectors and protein expression vectors-characteristics and properties.
- DNA Cloning and libraries (cDNA, genomic, random mutations).
- Main recombinant DNA techniques (isolation, electrophoresis, DNA hybridization and Southern imprinting).
- DNA sequencing. Modern applications of -omics technologies in Food Biotechnology.
- Microbial Biotechnology
- Industrial fermentations. Applications and products of Food Microbial Biotechnology.
- Plant and Animal Biotechnology
- GMOs in food production
- Regulations and biosafety. Legal and social issues arising from Food Biotechnology applications
- Ethical Issues of Food Biotechnology.

Laboratory Exercises

DNA Isolation, Polymerase chain reaction (PCR), Agarose gel electrophoresis, Enzymatic digestion of plasmid DNA, Transfection of bacteria with recombinant plasmids, Isolation of recombinant plasmid DNA

4.TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures and Laboratory practice 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*	

Activities	***Work Load per semester***
Lectures (3 hours per week x 13 weeks)	39
Laboratory exercises (2 hour per week x 13 weeks)	26
Laboratory reports (2 hours per week x 5 reports)	10
Final examination (3 hours)	3

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*	Non-guided study: 47 ***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.*	Language of evaluation: GREEK Methods of evaluation: Written examination (including Lab exercises) after the end of the semester (100%) including: • Multiple-choice questionnaires • Short-answer questions • Open-ended questions Grading scale: 1 to 10. Minimum passing grade: 5. Examination time: 3 hours. The final grade for the course is calculated by the final grade in the Lab (30%) and the grade of the final written examination (70%). The student must have secured a minimum grade of 5 in both Lab and the final written examination.

5. **ATTACHED BIBLIOGRAPHY**

-Suggested bibliography:
Σύγχρονη Βιοτεχνολογία Τροφίμων , **ISBN: 978-960-489-108-5**
ΣΥΓΓΡΑΦΕΑΣ: Μπατρίνου Α. ΕΚΔΟΤΙΚΟΣ ΟΙΚΟΣ: Ιατρικές Εκδόσεις Π. Χ. Πασχαλίδης , 2010

-Related academic journals:
Nature , Science , Proceedings of National Academy of Sciences, USA (PNAS) , Nature Reviews Genetics , Nature Reviews Molecular Cell Biology , Molecular Cell, Microbiology and Molecular Biology Reviews, EMBO Journal, Molecular Biology and Evolution, Molecular and Cellular Biology, Trends in Biotechnology (TIBTECH)