SCHOOL	FACULTY OF ENVIRONMENT		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**FST402**	**SEMESTER**	4
COURSE TITLE	**FOOD CHEMISTRY**		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercise, 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	2	
Laboratory exercise	2	
Total	4	6
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*	Specialised general knowledge
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in Greek)
COURSE WEBSITE (URL)	

LEARNING OUTCOMES

Learning Outcomes

The course earning 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 the successful completion of the course, the student will be able:

- To know the basic food components (water-ice, carbohydrates, lipids, amino acids, peptides, protein, enzymes).
- To understand the structure of the aforementioned components
- To understand their primary chemical and biochemical properties but also their functions
- To understand the basic functional properties of protein, polysaccharides and lipid compounds.

- To understand the conditions of disintegration in food systems and controlled the physicochemical processes involved.
- To interpret the behaviour, performance and interactions of primary food components within a food system.
- To describe the basic physical, chemical and biochemical processes that affect food quality degradation during food processing and preservation, impair food quality and also shelf life of food.

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* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*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* *.....* *Others...* *.....*

- Adapting to new situations
- Decision-making
- Working independently
- Team work
- Criticism and self-criticism
- Production of free, creative and inductive thinking
- Search for, analysis and synthesis of data and information, with the use of the necessary technology

SYLLABUS

Theoretical part of the course:

- Water: physical properties, structure water-ice, interactions of water with other water soluble compounds, sorption phenomena, water activity (a_w) and food stability.
- Carbohydrates: classification, names, structures and dietary function. Monosaccharides, oligosaccharides, polysaccharides. Carbohydrate reactions. Hydrolysis, dehydration, thermal degradation, non-enzymatic browning. Mono- and oligosaccharides functions in foods. Hydrophilic character, sweetness, food browning products. Functional properties of polysaccharides. Interaction of food structure and physical properties, Water-polysaccharides interactions, acidic polysaccharides. Starch, structure of starch granules, starch gelatinisation and gel formation, starch rearrangement. Modified starch. Glycogen, cellulose, hemicellulose. Pectine, natural gums.
- Lipids: Classification and names. Fatty acids, acylglycerol, phospholipids, glycolipids, lipoproteins. Physical and chemical properties. Oil and fat, composition, properties, chemical activity and reactions. Emulsions-emulsifiers. Lipid changes in food, lipolysis, autoxidation of lipids, thermal degradation. Processed fats and refined oils chemistry. Lipid function and effect on the organoleptic characteristics of food (flavour, taste, odour). Physiological activity of lipids.
- Amino acids, peptides, protein: Physical and chemical properties, protein denaturation. Functional properties of proteins (water holding capacity, solubility, viscosity, gel forming and foaming ability, emulsification, viscoelastic properties of gluten, interaction on flavour and aroma compounds). Dietary properties of protein. Chemical and enzymatic modification of protein. Changes of protein during food processing and food preservation.

Laboratory exercises:

- Determination and adjustment of sugar concentration in food and wine
- Monitoring, estimation and adjustment of food and wine acidity
- Wine clarification using proteins
- Addition, monitoring and adjustment of SO_2
- Determination of free, total and bound sulphites
- Emulsions-Emulsifiers
- Lipid extraction and estimation using the Mojonnier method
- Non-enzymatic browning: Maillard reaction

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 technology on data collection and information, in teaching and communication. Communication with students via web, e-mail, e-class and online folder sharing options 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*	
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.*	Evaluation procedure performed in Greek Evaluation procedures: Written evaluation in questions of scaling difficulty • Two examination tests are performed in-between semester • Final examination The final grade is determined by the following formula: 40% of laboratory exercise grade and 60% of theory examination grade.

Activity	*Semester workload*
Lectures	78
Laboratory exercise	26
Total contact hours and training	***104***

ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Belitz H. – D., Grosch W., Schieberle P., Food Chemistry, 2011 *(In Greek)*.
- Boskou, D., Food Chemistry, 2007 *(In Greek)*.
- Sflomos, K., Food Chemistry and Nutrition facts, Volume 1, 2011 *(In Greek)*.
- Galanopoulou, K., Zabetakis, G., Mavri-Vavayianni, M., Siafaka, A., Nutrion and Food Chemistry, 2007 *(In Greek)*.

Performance Statistics of the last 2years			
Grade (descending order)	**absolute frequency**	**relative frequency %**	**sum of success rates per class**
FOOD CHEMISTRY			
10	1	1%	1%
9	12	9%	10%
8	18	13%	23%
7	27	20%	43%
6	77	57%	100%
	135	100%	