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| SCHOOL | ENVIRONMENT | | |
| ACADEMIC UNIT | FOOD SCIENCE AND TECHNOLOGY | | |
| LEVEL OF STUDIES | UNDERGRADUATE | | |
| COURSE CODE | FST301 | SEMESTER | 3 |
| COURSE TITLE | Food Biochemistry | | |
| INDEPENDENT TEACHING ACTIVITIES <i>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</i> | WEEKLY TEACHING HOURS | CREDITS | |
| Lectures | 2 | | |
| Laboratory | 2 | | |
| Total | 4 | 6 | |
| <i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i> | | | |
| COURSE TYPE <i>General background, special background, specialised general knowledge, skills development</i> | Special background | | |
| 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 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:

- recognize basic biomolecules (carbohydrates, proteins, lipids, nucleic acids) and their chemical composition, structure and function.
- classify proteins based on their structure and the functions.
- describe biosynthesis and catabolism of biomolecules.
- know the role of nucleic acids in the biosynthesis of proteins.
- know the mechanisms of enzymatic reactions and to determine their kinetic constants.

- understand the basic biochemical changes in food processing and processing.
- integrate their knowledge in the design of new methodological and experimental approaches in the field of Food Science and Technology and other related sciences.

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

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Others...
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- Working in an interdisciplinary environment.
- Working in an international environment.
- Decision making.
- Autonomous work.
- Teamwork.
- Promote creative and inductive thinking.
- Analyze and synthesize of data and information in order to apply the theory in practice.

SYLLABUS

The course is the introductory theory to the basis of Food Biochemistry. It aims to give the students the acquisition of knowledge on the basic categories of biomolecules and the understanding of the basic biochemical metabolic pathways. The course material also aims at the study and understanding of biochemical processes that take place during the conversion of raw material (e.g. meat, milk, cereals, fruits and vegetables) in an edible finished product or a new type of food. Finally, the course aims to educate students on basic methodological and experimental applications in the field of Food Biochemistry. Specifically, in the context of the course lectures, the following will be analyzed, among others.

THEORY

- Introduction to Food Biochemistry: proteins, carbohydrates, lipids, membranes, enzymes and coenzymes.
- Basic principles of metabolism. Biological oxidations. Metabolism of carbohydrates, lipids and amino acids.
- Principles of gluconeogenesis, glycogen metabolism.
- Structure and role of nucleic acids, biosynthesis of macromolecule precursors, flow of genetic information, gene expression.
- Biosynthesis of food ingredients (e.g. milk).
- Biochemical changes in foods (meat, fish, cereals).
- Protein metabolism and gene expression.

LABORATORY

- Food enzymes: β -galactosidase, catalase and invertase study
- Study of reducing sugars

- Isolation and characterization of milk casein
- Amino acid analysis by thin-layer chromatography
- Effect of processing and storage on food natural colorants
- Quantification of food vitamins
- Isolation and characterization of food nucleic acids
- DNA electrophoresis

TEACHING and LEARNING METHODS - EVALUATION

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| <p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p> | Face-to-face | |
| <p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p> | Use of video projector and computer, Internet use | |
| <p>TEACHING METHODS <i>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</i></p> | <p>Activity</p> | <p>Semester workload</p> |
| | Lectures | 78 |
| | Laboratory | 26 |
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| | | |
| | | |
| <p>Total contact hours and training</p> | | <p>104</p> |
| <p>STUDENT PERFORMANCE EVALUATION <i>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></p> | <p>I. Final written examination in Theory course include:</p> <ul style="list-style-type: none"> - Short answer questions - Multiple choice questions or Right/Wrong questions <p>II. Final written examination in Laboratory course include:</p> <ul style="list-style-type: none"> - Short answer questions - Multiple choice questions or Right/Wrong questions <p>Gravity factor of the score is: THEORY 60% of the final course grade and LABORATORY 40% of the final course grade.</p> | |

ATTACHED BIBLIOGRAPHY

1. A. Vafopoulou Mastrogiannaki, Food Biochemistry A, ZITI Publications (2003) ISBN 960-431-830-6 & 13 978-960-431-830-8 (*in Greek*).
2. G. Diamantidis, Introduction to Biochemistry, UNIVERSITY STUDIO PRESS Publications (2017), ISBN 978-960-12-2356-8 (*in Greek*).

3. S. Kalogiannis, Introduction to Biochemistry, ZITI Publications (2018), ISBN: 978-960-418-722-5 (*in Greek*).
4. B.K. Simpson, Food Biochemistry and Food Processing, Wiley-Blackwell, 2012, ISBN 081380874X
5. C. Alais & G. Linden, Food Biochemistry, Ellis Horwood Ltd., 1991, ISBN 0-7476-0061-9
6. J. M. Berg, J. L. Tymoczko, L. Stryer, Biochemistry, University Press Kritis (2014), ISBN-13: 9789605244233 (*in Greek*).
7. Escin Michael NA. Biochemistry of Foods. Academic Press 2013.

| Performance Statistics of the last 2years | | | |
|--------------------------------------------------|-------------------------------|---------------------------------|-----------------------------------------------|
| Grade (descending order) | absolute frequency | relative frequency % | sum of success rates per class |
| FOOD BIOCHEMISTRY | | | |
| 10 | 9 | 7% | 7% |
| 9 | 10 | 7% | 14% |
| 8 | 32 | 24% | 38% |
| 7 | 48 | 36% | 74% |
| 6 | 35 | 26% | 100% |
| | 134 | 100% | |