COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	ANIMAL PRODUCTION, FISHERIES AND AQUACULTURE		
LEVEL OF STUDIES	UNDERGRATUATE		
COURSE CODE	**AS_303**	**SEMESTER**	**3rd**
COURSE TITLE	BIOCHEMISTRY		

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**
	3 LECTURES + 2 LAB	7
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*	general background, special background, specialised general knowledge,
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK. It can be taught in English in case of foreign students' presence.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
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 student, at the end of the relevant Learning Process, is in a position:

- To possess a general knowledge of the basic biochemical molecules, including their subunits and the small and large molecules present in the cell.
- To be able to recognize the different types of biochemical molecules and to know the essential chemical characteristics that make them necessary for life.
- Recognize the levels of protein organization and describe the stability of these structures
- Describe the representative mechanisms of enzymatic catalysis
- Describe the basic anabolic and catabolic pathways of (a) carbohydrates, (b) fats and lipids, (c) amino acids and proteins, (d) nucleic acids and (e) steroids.
- Understand the basic energy metabolism of cells.
- Understand the basic metabolic processes and basic metabolic pathways in the cell
- Recognize the importance of biochemistry in everyday life in the 21st century.
- Handle appropriately the use of lab intruments and facilities.

- Evaluate the results of a biochemical analysis
- Understand the essential technological requirements for designing a biochemical analytical process

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…*
	…….

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

3. SYLLABUS

Lectures:

1. Molecular design and biochemical evolution
2. Amino acids, Proteins. Structure and Function.
3. Enzymes and enzymatic activity.
4. Carbohydrates and Lipids with an emphasis on their biological significance.
5. Basic concepts of metabolism
6. Glycolysis - pathway of phosphate pentose
7. Citric acid Cycle.
8. Oxidative phosphorylation
9. Carbohydrate metabolism and its regulation (anabolism, catabolism) - gluconeogenesis.
10. Lipid metabolism and its regulation
11. Hormonal regulation of metabolism,
12. Vitamins and minerals
13. Summary and integration of metabolism

Lab exercises:

1. General Safety Standards in the Biochemical Laboratory. Instrument handling.
2. Isolation of proteins.
3. Denaturation of proteins.
4. Enzymatic kinetics reactions.
5. Identification and separation of amino acids by thin layer chromatography (TLC)
6. Electrophoresis.
1. Gas Chromatography

1. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face teaching. During the course the students will be invited to approach a research question and write a brief bibliographic essay, form their own questions to their colleagues based on the new information and participate in the interaction and learning activities after the lectures (eg coaching of colleagues, questioning their colleagues, class summary, "teach my classmate", etc.).
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	○ Power Point in lectures ○ Power Point in laboratory exercises ○ Using the e-Class platform for: ➢ Distribution of lectures ➢ Self-assessment exercises ➢ Learning streamline ➢ Deposit, monitoring and evaluation of work ➢ "After-class" activities ➢ Laboratory Examinations ➢ Progress evaluation
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***
1. Lectures (3 hours X 13 weeks)	39
2. literature search and reading connected with (1) (2 hours X 13 weeks)	26
3. Self-evalution exesrcises in e-Class (1 hours X 13 weeks)	13
4. LAB exercises (2 hours X 13 weeks)	14
5. Writing short lab reports or lab evaluation connected to (4) (1 hours X 13 weeks)	7
6. Participation in the "after class" activities (2hours X 13 weeks)	26
7. Study and preparation for the evaluation workload	22
8. Final exams	3
Course total *(6X25)*	***150***

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*	The evaluation will be done in Greek unless there is necessity for an avluation in English because of the presebce of foreign students. The evaluation will be done as following:

Writing short lab reports or lab evaluation (Average of the report grades)	20%

examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Participation in the "after class" activities (Average) 15% Participation in the "after class" activities (Average) 15% Final exams 50% *Minimum grade to pass: 5 (Range: 0-10)* In the case of evaluation failure (in theory of the lab) the exams will be repeated but the follow up of the lab exercises it is not obligatory as long as the student was present in all the necessary lab exercises. The evaluation grades of the other activities (eg after class) will be valid for the next two (2) years, meaning four (4) semesters from the typical semester taught.

2. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Garrett, C. M. Grisham (2019) Biochemistry, 6 edition. Cengage Learning
Berg, Tymoczko, Gatto Jr., Stryer (2017) Biochemistry, W. H. Freeman; Eighth edition (April 8, 2015)
ΓΕΩΡΓΑΤΣΟΣ Ι. (2005) ΕΙΣΑΓΩΓΗ ΣΤΗ ΒΙΟΧΗΜΕΙΑ, εκδόσεις Γιαχούδης & ΣΙΑ Ο.Ε.
Γεωργάτσος. Εργαστηριακές ασκήσεις βιοχημείας, Εκδόσεις Ζήτη

- Related academic journals:

Cell
Biochemistry
Journal of Biochemistry
Journal of Molecular Biology
Journal of Food Biochemistry
Nucleic Acids Research