Outline_BIOCHEMISTRY II_en.docx

COURSE OUTLINE

1. GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	BIOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BIO_ΓΥ04	SEMESTER	3rd
COURSE TITLE	BIOCHEMISTRY II		

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
Lectures	3	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:	PHYSICS, INORGANIC/ORGANIC CHEMISTRY, MATHEMATICS
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)
COURSE WEBSITE (URL)	http://www.biology.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 course completion, students will have acquired knowledge in the biochemistry of metabolism, and will have understood the basic catabolic and anabolic pathways:

1. that are involved in the formation, maintenance, growth and multiplication of living matter, as well as the interconnection, regulation, plasticity, and coordination that characterize the phenomenon of metabolism.
2. on which the phenomenon of life is based, in order for the student to be able to deepen his/her understanding into the chaotic and at the same time spatially restrained compartmental causative interactions of metabolism with the internal and external environment.

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…* *…….*

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

3. COURSE CONTENT

1. Introduction to the membrane transport systems (pores, channels, transport proteins).
2. Common strategies in metabolism.
3. Krebs and glyoxylate cycles.
4. Endocellular transport of NADH and NADPH.
5. Prosthetic groups and coenzymes/vitamins.
6. Glycolysis and glycogen degradation.
7. Gluconeogenesis and glycogen biosynthesis
8. Control of glucose level in the blood.
9. Pentose phosphate pathway.
10. Biochemical thermodynamics of photosynthesis.
11. Kalvin cycle.
12. Fatty acid biosynthesis and degradation (ketone bodies).
13. Amino acid biosynthesis and degradation.
14. Urea cycle and general principles of the nitrogen cycle.
15. Nucleotide/nucleoside biosynthesis and degradation.
16. Cholesterol and lipoprotein (VLDL, LDL, HDL) biosynthesis.
17. Control and coordination of metabolism.

<u>Laboratory Exercises</u>
Not offered

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face. Discussion during lecture. Encouragement in keeping notes.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	

Use of ICT in teaching, laboratory education, communication with students	
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* Lectures — 40 Course total — **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 examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Written exams at the end of the semester

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. Lehninger Basic Principles of Biochemistry, Nelson, D., Cox, M.
2. Basic Biochemistry, Demopoulos, K. A. and Antonopoulou, S. (in Greek language)