COURSE OUTLINE

(1) GENERAL

SCHOOL	Health Sciences		
ACADEMIC UNIT	Faculty of Medicine		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**IAY403**	**SEMESTER**	**C (3nd)**
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 and laboratory exercises	6	7.5
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*	General background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes/English
COURSE WEBSITE (URL)	http://ecourse.uoi.gr/enrol/index.php?id=160

(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*

Students are expected to familiarize themselves with the concepts and basic pathways of metabolism, with the basic mechanisms of coordination and regulation of metabolic reactions at the level of the organism, as well as with processes of deregulation of specific metabolic reactions in particular metabolic disorders. In this context, it is important for the students to consolidate that the knowledge of metabolism and metabolic regulation is fundamental for optimal disease treatment in medical practice. They are also expected to gain a practical experience in basic laboratory techniques and data analysis in Biochemistry.

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
- Working in an interdisciplinary environment
- Respect for difference and multiculturalism
- Criticism and self-criticism
- Laboratory experience in basic biochemical techniques

(3) SYLLABUS

- Basic concepts of metabolism**:**
  Catabolism, anabolism. Energy interconversions. Regulation of metabolic reactions. Principles of extracellular regulation. Signal transduction.
- Sugar metabolism:
  Glycolysis. Glyconeogenesis. Pentose phosphate pathway. Glycogen metabolism. Glycogen storage diseases.
- Energy metabolism:
  Citric acid cycle. Oxidative phosphorylation. Transport systems related with oxidative phosphorylation and the citric acid cycle.
- Lipid and fatty acid metabolism:
  Lipolysis, β-oxidation, keton bodies. Biosynthesis of fatty acids, ecosanoids. Biosynthesis of phospholipids. Biosynthesis of cholesterol. Lipoproteins. Bile acids. Steroid hormones. Lipids and membrane targeting of proteins. Vitamin D.
- Amino acid and nucleotide metabolism:
  Nitrogen metabolism. Urea cycle. Amino acid catabolism. Biosynthesis of amino acids. Methyl cycle, homocysteine**.** Biosynthesis of nucleotides: regulation, salvage pathways, anticancer drugs. Nucleotide catabolism, Uric acid.
- Integration of metabolism:
  Coordination of different metabolic pathways in human in relation to the various nutrient requirements and hormonal regulation.

Objectives

Understanding metabolism as a set of biochemical reactions and processes related with the flow, interconversions and utilization of energy in living systems, regulation and homeostasis of the metabolic pathways of different types of biomolecules (sugars, fatty acids, amino acids, nucleotides) as well as their connections to human physiology and disease.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Teaching is implemented through lectures (face-to-face teaching) and complementary practical exercises.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Powerpoint slides and videos are used in the lectures. The powerpoint slides and videos presented, as well as complementary teaching material (links to important research articles or related textbooks, etc.), are freely accessible to the students through the e-course system of the University of Ioannina. The e-course system is also used for updates and communication with the students on several practical aspects of the teaching process or the exams. (see Messages and Forum, in http://ecourse.uoi.gr/enrol/index.php?id=160). E-mail addresses of the teaching staff are made available to students and are freely used as a means of communication.
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	65
Laboratory courses	12
Course total	*77*

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 Evaluation through written exams (mid-term and final exam or final exam only) Each written exam includes a weighted list of the following types of questions: Short-answer questions Open-ended questions Questions requiring combination of knowledge from different chapters Questions requiring critical thinking/interpretation Multiple-choice or double-choice (yes/no) questions

(5) ATTACHED BIBLIOGRAPHY

- Teaching – study material:

1. R. H. Garrett, C. M. Grisham, **Biochemistry**, 6th edition, Cengage Learning, 2016, Utopia Publishing, 2019 (eudoxus system, code 7713116), ISBN: 978-618-5173-40-1.
2. J. M. Berg, J. L. Tymoczko, G. J. Gatto Jr., L. Stryer, **Biochemistry**, W. H. Freeman, 9th edition, Crete University Press, 2021 (eudoxus system, code 102074412), ISBN: 978-618-524-636-5.

3. Additional bibliography suggested for further reading can be found at the lesson e-course page: http://ecourse.uoi.gr/enrol/index.php?id=43