OURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED BIOLOGY AND BIOTECHNOLOGY		
DEPARTMENT	BIOTECHNOLOGY		
STUDY LEVEL	*Undergraduate*		
COURSE CODE	**2790**	**SEMESTER**	1st
COURSE TITLE	CELL BIOLOGY		
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	1,56
Laboratory Courses		2	0,40
Autonomous study			3,04
TOTAL			**5,00**
COURSE TYPE	General background		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/BIOTECH158/		

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*
- *and Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning*

Appendix B

- *Guidelines for writing Learning Outcomes*

This course aims to introduce students to basic principles of Cell Biology. A description of the possible origin and evolution of life will be given, the ultrastructure of the eukaryotic cell (nucleus, endoplasmic reticulum, plastids, chloroplasts, mitochondria, Golgi apparatus, cytoskeleton, membranes etc) will be covered in detail, and cell behaviour *in vivo* and *in vitro* will be discussed.
Students will also be introduced to fundamental cell biology techniques and will gain an understanding of how they are applied to specific problems in cell biology.
This course will provide an invaluable foundation for more specialized courses that the students will encounter in later semesters.
On completion of the course the student should:

- Learn about the basic structures of the eukaryotic cells and relate them to their cellular functions
- Learn about how the complexity and diversity exhibited by present-day cells evolved

- Acquire knowledge towards to current methods and experimental techniques used in cellular biology research
- Be able to match the proper microscopy techniques with the specimen or the process he/she would like to observe
- Develop critical thinking and presentation skills by delivering a report and/or presenting a scientific paper

	General Competences
Supplement and appear below), at which of the following does the course aim?	
Working in an international environment *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Production of free, creative and inductive thinking* *Others...*

- Technically proficient in commonly used laboratory techniques, with minimal support
- Make informed decisions on biological issues
- Work independently
- Production of free, creative and inductive thinking

3. COURSE CONTENT

1. The cellular basis of life
2. The origin and evolution of the cells (paleobiology)
3. Eukaryotic and prokaryotic cells (similarities and differences)
4. Comparison of plant and animal cells
5. Cell functions and processes
6. Cell membranes
7. The nucleus (the nuclear envelope, internal organization, the nucleolus)
8. The endoplasmic reticulum and protein processing
9. The Golgi apparatus (structure and function)
10. Lysosomes (endocytosis, phagocytosis, pinocytosis)
11. Cytoskeleton (microtubules, intermediate and actin filaments)
12. Mitochondria, chloroplasts and peroxisomes
13. Cell walls (structural proteins, plasmodesmata, gap junctions, desmosomes and tight junctions)
14. Nerve cell

4. TEACHING and LEARNING METHODS - EVALUATION

TEACHING METHOD *Face-to-face, Distance learning, etc.*	Class courses (amphitheatre /lab courses room)
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES *Use of ICT in teaching, laboratory education, communication with students*	Power point presentations. Student contact electronically.
TEACHING ORGANISATION *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	39 h
Laboratory Courses	10 h

	Autonomous study (personal assignment)	76 h
	Total (25 hours of student workload per ECTS)	***125 h***
STUDENT EVALUATION *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.** Written final examination in theory (50%) Exam questions will be developed from lecture, compilation of lab test assays and assigned reading material. Exams will take the format of multiple choice and short answers to questions. **II.** Written final examination in laboratory courses (50%) including: - Multiple choice questions - Critical analysis questions The final grade for the course is determined by the total results for the different parts of the examination.	

5. BIBLIOGRAPHY

- Suggested textbooks:

- The Cell. A molecular approach (8th edition) G.M. Cooper & R.E. Hausman (2021) Sinauer Associates.
- Essential Cell Biology (4th edition). Alberts, B., Bray, D., Hopkins, K., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P. (2014) New York: Garland Press.
- Life The Science Of Biology 10th Edition Sadava D., Hillis D., Heller C., Hacker S. (2012)

-Related scientific journals:

- Molecular Cell
- The Plant Cell
- Development
- Developmental Cell
- New Phytologist
- Plant Journal