COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED BIOLOGY AND BIOTECHNOLOGY		
ACADEMIC UNIT	BIOTECHNOLOGY		
LEVEL OF STUDIES	BACHELOR OF SCIENCE		
COURSE CODE	**2790**	**SEMESTER**	1st (fall semester)
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	0,12
Laboratory Courses	2	0,08
TOTAL ECTS (Table 4)		**5,00**
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General knowledge
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in english)
COURSE WEBSITE (URL)	www.aua.gr/plantdevelopment

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*

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 behavior *in vivo* and *in vitro* will be discussed.

Students will also be introduced to foundamental 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

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…

- 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. SYLLABUS

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)

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Class courses (amphitheater/lab courses room)
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Power point presentations. Student contact electronically.
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.*	

Activity	*Semester workload*
Lectures	39 h
Laboratory Courses	26 h
Autonomous study (personal assignment)	60 h

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	***Total (25hours of working input per credit unit)***	***125 h (5 ECTS)***
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*	**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. ATTACHED BIBLIOGRAPHY

- *Suggested textbooks:*

- The Cell. A molecular approach (6th edition) G.M. Cooper & R.E. Hausman (2013) 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.

-*Related scientific journals*:

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