**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | Health Sciences | | | | |
| **ACADEMIC UNIT** | Biological Applications and Technology | | | | |
| **LEVEL OF STUDIES** | Undergraduate | | | | |
| **COURSE CODE** | **BEY101** | **SEMESTER** | | **1st** | |
| **COURSE TITLE** | GENERAL BIOLOGY I | | | | |
| **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** |
|  | | | 6 | | 6 |
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| *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:** | No | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | No | | | | |
| **COURSE WEBSITE (URL)** | http://ecourse.uoi.gr/course/view.php?id=513 | | | | |

1. **LEARNING OUTCOMES**

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| **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 course of Biology I is the introductory course of Biology of the First Semester, thus delineating the subject of science from the molecular to the cellular level. Its further aim is to embody the principle that Biology is a highly experimental science whose applications cover a wide range of specialized cognitive subjects.   Upon completion of the course the students will be able to understand:   1. the transition from abiotic matter into the cellular organization of life, 2. the need for energy and the mechanisms for acquiring and managing it for living beings, 3. breeding as a basic biological requirement and the rules governing it, and finally 4. the molecular basis of heredity and its mechanisms of regulation. | |
| **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…*  *…….* |
| • Adapting to new situations  • Autonomous Work  •Teamwork  • Working in an interdisciplinary environment  • Promote free, creative and inductive thinking | |

1. **SYLLABUS**

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| Course Theory:  • Emergence and evolution of scientific thinking in biology. Rules governing the life and science of Biology.  • The chemistry of life. Water and carbon compounds as prerequisites of life.  • Biomolecules (proteins, nucleic acids, carbohydrates, lipids).  • Architectural organization and basic principles of cell operation. (prokaryotic / eukaryotic, cell membrane and cell wall, cytoskeleton, intracellular membrane system, mitochondria, chloroplasts, etc.).  • Basic principles of metabolism. Cellular respiration and photosynthesis.  • Basic principles of cellular communication.  • Cell proliferation and cell cycle.  • Meiosis and Reproduction .  • The molecular basis of heredity. From Mendel to the concept of gene. From the gene to the protein. Basic principles of gene expression.  Laboratory exercises:  • Eukaryotic cell morphology. Microscopic observation of predominantly unicellular organisms (Protista). Clarification of basic structures. (cell / shell, cell / colonial organization, nucleus / cytoplasm, chloroplast, cell wall).  • Morphology of prokaryotic cells. Microscopic observation of bacteria. (gram +, gram-, cyanobacteria, etc.).  • Growth of prokaryotic cells on a solid substrate. Bacterial nutrition, Colonies.  • Structure and Function of Eukaryotic Cell Membranes. Osmosis and permeability.  • DNA isolation from cells in the oral cavity.  • Cell cycle. Mitotic cell division as observed in the onion nodule. Distinction of mesophase / mitotic cells. Identification of mitotic stages.  • Reduced cell division (Meiosis) for gametes production. Microscopic observation in lily anthers. |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | Face to face, (Theory class, Laboratory class) |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | Communication with students by electronic means. Support Learning through the e-course e-learning platform. Posting of lectures on laboratory theory. Launch of the lab guide online. |
| **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 | 39 | | Laboratory theory | 6 | | Laboratory practice | 18 | | Autonomous study hours | 82 | |  |  | |  |  | |  |  | |  |  | |  |  | | Course total | ***145*** | |
| **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 of course theory (80%) involving: Short answer and problem solving questions, multiple choice tests  II. Written examination in the theory and practice of laboratory exercises (20%), including short answer and problem solving questions, multiple choice tests  III. Assessment of the results obtained after the completion of each laboratory exercise (not rated) |

1. **ATTACHED BIBLIOGRAPHY**

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| *- Suggested bibliography:*  *- Related academic journals:*  **•** Biology (Volume I) N.A. Campbell & J.B. Reece, 8th edition, Pearson Benjamin Cummings, 2007.  • Biology (Basic concepts and principles) Starr, C. Evens, C.A., Starr, L. Utopia 2015.  • Laboratory exercises in Biology. K. Vareli, I. Sainis Tragas, University of Ioannina, 2015 |