COURSE OUTLINE

(1) GENERAL

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>PHYSICAL SCIENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>BIOLOGY</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>UNDERGRADUATE</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>BIO_AY05</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>1</td>
</tr>
<tr>
<td>COURSE TITLE</td>
<td>PHYSICS</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th>WEEKLY TEACHING HOURS</th>
<th>CREDITS</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>8</td>
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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
Introductory lesson in Physics.
Emphasis is given to laws, phenomena and techniques related to biology issues.

PREREQUISITE COURSES:
There are no pre-requisite courses.

LANGUAGE OF INSTRUCTION and EXAMINATIONS:
Greek

IS THE COURSE OFFERED TO ERASMUS STUDENTS:
Yes

COURSE WEBSITE (URL):
Page at: eclass.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

Students, after successful completing of the course, are expected to:
• Have acquire the logical order of knowledge that interprets the phenomena of classical physics.
• Be aware of the concepts-quantities and physical laws that govern the quantitative (numerical values) and qualitative relationships (e.g. relative orientation) between the quantities involved.
• Be able to apply the physical laws and solve the problems in order to calculate useful quantities.
• Identify the physical laws governing application devices in technology and in everyday life.
• Be aware of exposure limits and effects of various laboratory conditions (e.g. extremely low temperatures, high pressures, volatility, electric currents, radiation, etc.) in order to take appropriate precautions.
• Be convinced that the study of life phenomena is facilitated by the development of our knowledge and diagnostic techniques based also on the research and development of Physics.
Be interested and have appreciated interdisciplinarity in terms of Biology and Physics and be aware of the new knowledge in this field.
Students, after successfully completing of the course, are expected to have the ability to:

• Appreciate and be interested in the interdisciplinary field of Biology and Physics.
• search for the new knowledge in this field
• Promote their creative thinking within the frame of the scientific culture.
• Respect the natural laws and the limits they pose to humans and the natural environment concerning hazards.
• Have the ability to combine and interpret elements within the cognitive field of Biology and Physics in order to form judgments that reflect on relevant social, scientific or ethical issues.
• Be able to communicate information, ideas, problems and solutions to both qualified and non-specialized audiences.
• Have developed those skills needed in order to decide the subject they will follow for further studies.

(3) SYLLABUS

Physics and Biology.
Quantities and unit systems.
Graphic representations of phenomena.
Forces. Torques.
Classical physics, Newton's Laws.
Energy.
Heat, specific heat, temperature. Phase conversions.
Hydrostatics, buoyancy, fluid dynamics (Bernoulli's equation and continuity equation).
Elasticity.
Surface tension.
Harmonic oscillation. Waves.
Electricity. Ohm's Law - Resistance. The potentiometer.
Electric current and magnetic field.
Alternative current.
Rectifiers and diodes.
Instruments for measuring electrical quantities.
Electron emission.
Electromagnetic radiation.
Motion of electric charge in magnetic field. Cyclotron. Electronic Microscope.
Bohr's atomic model. Elements of modern (quantum) physics. Radioactive nuclei, radioactivity.
(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Lectures in Classroom</th>
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<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>e-class platform email</td>
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<tr>
<td>TEACHING METHODS</td>
<td>Activity</td>
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<td></td>
<td>Lectures</td>
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<td>Little projects</td>
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<td>Study</td>
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<td></td>
<td>Exams</td>
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<td></td>
<td>Course total</td>
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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.

The assessment is done by Written Examination (Oral, where necessary).

The written examination
  • aims to find out the degree of achievement of certain learning outcomes.
  • evaluates the accuracy and clarity in the documentation of the arguments needed for the answers and the solution of problems.
  • evaluates the accuracy and diligence in the figures and diagrams.
  • evaluates the commentary on results of the mathematical solution.

The assignments given during the course are optional, but their delivery and the positive results after their evaluation, add up to one unit to the final score.

The evaluation process is done in the Greek language (except in the case of Erasmus students, which are examined in English).

Scoring in scale 1-10.
- Suggested bibliography:
  3. H. D. Young, University Physics (Volume I) Πανεπιστημιακή με σύγχρονη Φυσική, Μηχανική-Κύματα, εκδόσεις Παπαζήση.
  4. H. D. Young, University Physics (Volume II) Ηλεκτρομαγνητισμός-Οπτική-Σύγχρονη Φυσική, τόμοι Α,Β, εκδόσεις Παπαζήση.
- Related academic journals: