

## ETY202 - Chemistry II (Organic Chemistry)

### COURSE OUTLINE

#### (1) GENERAL

|   |   |                 |   |
|---|---|-----------------|---|
| <b>SCHOOL</b>   | SCHOOL OF ENGINEERING   |                 |   |
| <b>ACADEMIC UNIT</b>  | DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING   |                 |   |
| <b>LEVEL OF STUDIES</b>   | UNDERGRADUATE   |                 |   |
| <b>COURSE CODE</b>  | ETY202  | <b>SEMESTER</b> | 2 |
| <b>COURSE TITLE</b>   | Chemistry II (Organic Chemistry)  |                 |   |
| <b>INDEPENDENT TEACHING ACTIVITIES</b><br><i>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</i> | <b>WEEKLY TEACHING HOURS</b>  | <b>CREDITS</b>  |   |
| Lectures  | 4   | 4               |   |
|   |   |                 |   |
| <i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>  |   |                 |   |
| <b>COURSE TYPE</b><br><i>general background, special background, specialised general knowledge, skills development</i>  | GENERAL BACKGROUND  |                 |   |
| <b>PREREQUISITE COURSES:</b>  |   |                 |   |
| <b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>  | HELLENIC  |                 |   |
| <b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>  | NO  |                 |   |
| <b>COURSE WEBSITE (URL)</b>   | <a href="http://ecourse.uoi.gr/course/view.php?id=2266">http://ecourse.uoi.gr/course/view.php?id=2266</a> |                 |   |

#### (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 is an introductory course of organic chemistry which aims to transfer the basic knowledge of organic chemistry that is required for the successful completion of other undergraduate courses of general background and/or specialization, such as materials chemistry, polymer chemistry/polymer materials and biomaterials.

**Learning outcomes:** Upon successful completion of this course, the students will be able to know a) the structure and nomenclature of organic compounds that are widely used in materials chemistry and b) the chemistry of different classes of organic compounds that are used as precursors for the design and synthesis of new materials.

**Skills:** Through this basic knowledge, the students will acquire skills in the synthesis/modification of materials with principles of organic chemistry.

**Competences:** Through the acquired knowledge, the students will be able to cope in an interdisciplinary environment where organic chemistry is one of the key components in the design and synthesis of materials.

### 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...*

*.....*

- Work in interdisciplinary environment
- Production of new research ideas
- Autonomous work
- Teamwork
- Design and project management

### (3) SYLLABUS

Atomic structure and bond formation. Chemical bonds and molecular properties of organic compounds. Stereochemical conformations of alkanes and cycloalkanes. Brief survey of organic reactions. Chemistry of alkenes, alkynes and alkyl halides. Reactions of alkyl halides: nucleophilic substitution and elimination reactions. Stereochemistry. Structure determination of organic compounds: Mass spectrometry, infrared spectroscopy, nuclear magnetic resonance spectroscopy and ultraviolet spectroscopy. Chemistry of benzene: Electrophilic aromatic substitution.

### (4) TEACHING and LEARNING METHODS - EVALUATION

|  |  |                          |
|--|--|--------------------------|
| <b>DELIVERY</b><br><i>Face-to-face, Distance learning, etc.</i>  | Face to face   |                          |
| <b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b><br><i>Use of ICT in teaching, laboratory education, communication with students</i>  |  |                          |
| <b>TEACHING METHODS</b><br><i>The manner and methods of teaching are described in detail.<br/>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.<br/><br/>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</i> | <b>Activity</b>  | <b>Semester workload</b> |
|  | Lectures   | 52                       |
|  | Additional study sections to prepare students for the final exam | 8                        |
|  | Office hours for student guidance                                | 14                       |
|  | Independent Study  | 26                       |
|  |  |                          |
|  |  |                          |

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|  |  |     |
|  | Course total (25 hours workload per credit unit)   | 100 |
| <p style="text-align: center;"><b>STUDENT PERFORMANCE EVALUATION</b></p> <p><i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p> | <p>LANGUAGE OF EVALUATION: Greek</p> <p>METHOD OF EVALUATION:</p> <p>Final Exam (100%) which contains:</p> <ul style="list-style-type: none"> <li>• Multiple choice questions</li> <li>• Organic chemistry work problems related to the content of the course</li> </ul> |     |

#### **(5) ATTACHED BIBLIOGRAPHY**

*- Suggested bibliography:*

- Organic Chemistry, John McMurry, Crete University Press, Iraklio, 2012
- Organic Chemistry for Life Sciences, David Klein, Utopia Publications, Athens, 2015

*- Related academic journals:*