**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | HEALTH OF SCIENCES | | | | |
| **ACADEMIC UNIT** | BIOLOGICAL APPLICATIONS AND TECHNOLOGY | | | | |
| **LEVEL OF STUDIES** | UNDERGRADUATE | | | | |
| **COURSE CODE** | **BEY106** | **SEMESTER** | | **1** | |
| **COURSE TITLE** | BASIC ORGANIC CHEMISTRY | | | | |
| **INDEPENDENT TEACHING ACTIVITIES** | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
| LECTURES | | | 4 | | 6 |
|  | | |  | |  |
| **COURSE TYPE** | GENERAL BACKGROUND | | | | |
| **PREREQUISITE COURSES:** |  | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | GREEK | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | ΝΟ | | | | |
| **COURSE WEBSITE (URL)** |  | | | | |

1. **LEARNING OUTCOMES**

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| **Learning outcomes** |
| The course aims to provide the fundamental basic principles to understand the structure and reactivity of organic molecules. Students will understand the relationship between structure and function of molecules and the major classes of reactions with emphasis on substitution and elimination reactions. Upon completion of this class, students will be able to predict three-dimensional structures, the reactivity of specific functional groups and determine the chirality of organic compounds. |
| **General Competences** |
| The purpose of the course is for the students to understand the basics principles of the science of chemistry. Also the students are induced in understanding the role of organic chemistry in biochemistry and other biological subjects. |

1. **SYLLABUS**

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| 1. Structure and Bonding  * Review of general chemistry, atoms, bonds, and molecular geometry, molecular orbitals, hybridization  1. Polar Covalent Bonds, Acids and Bases  * Electronegativity, formal charge, resonance structures, definitions and strengths of acids and bases, organic acids and bases  1. Overview of Organic Reactions  * Major classes of organic reactions, introduction to mechanisms, radicals, polar reactions, nucleophilicity-electrophilicity, equilibria, rates and energy changes, bond dissociation energies, energy diagrams  1. Alkanes and Stereochemistry  * IUPAC naming rules, common names, functional groups, isomers, alkyl groups, properties of alkanes, conformations and Newman projections  1. Cycloalkanes and Stereochemistry  * IUPAC naming, cis-trans isomerism, stability, ring strain, polycyclic molecules  1. Stereochemistry at Tetrahedral Centers  * Chirality, optical activity, rules for specifying R and S configurations, diastereomers  1. Alkenes: Structure, Reactivity, Reactions and Synthesis  * Carbon-carbon double bonds, IUPAC Naming, electrophilic addition reactions, stereoisomerism, elimination reactions, halogenation reactions, reductions and oxidations reactions, stereochemistry rules for specifying cis and trans conformations and E and Z configurations  1. Alkynes  * IUPAC naming, acidity, preparation of alkynes by elimination reactions of dihalides, addition reactions of HX and X2, hydrations, reductions  1. Alkyl halides  * IUPAC naming, properties of alkyl halides, preparation from alkanes and alkenes, Grignard reagents, organometallic coupling  1. Reactions: Nucleophilic Substitutions and Eliminations  * SN2, SN1, E2 and E1  1. Benzene  * Aromaticity, aromatic substitution, ortho- meta- para- directing groups |

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

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| **DELIVERY** | Face to face learning |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** | **Board and slide presentation** |
| **TEACHING METHODS** | |  |  | | --- | --- | | ***Activity*** | ***Semester workload*** | | Lectures | 52 | | Independently study | 156 | | Course total | ***208*** | |
| **STUDENT PERFORMANCE EVALUATION** | Written exams in the end of semester |

1. **ATTACHED BIBLIOGRAPHY**

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| Organic Chemistry, John McMurry, Crete University Press  Organic Chemistry for life sciences, David Klein, Utopia |