COURSE OUTLINE

(1) GENERAL

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	NO
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

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.

(3) SYLLABUS

1. GENERAL CHEMISTRY REVIEW – ORBITALS – REACTIONS
   - Review of general chemistry, atoms, bonds, and molecular geometry, molecular orbitals, hybridization, polar covalent bonds, electronegativity, formal charge, resonance structures, definitions and strengths of acids and bases, organic acids and bases, Major classes of organic reactions, introduction to mechanisms, radicals, polar reactions, nucleophilicity-electrophilicity, equilibria, rates and energy changes, bond dissociation energies, energy diagrams
2. ALKANES – CYCLOALKANES AND STEROECHEMISTRY
   - IUPAC naming rules, common names, functional groups, isomers, alkyl groups, properties of alkanes, conformations and Newman projections, cis-trans isomerism, stability, ring strain, polycyclic molecules
3. ALKENES - CYCLOALKENES
   - 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
4. ALKYNES
   - IUPAC naming, acidity, preparation of alkynes by elimination reactions of dihalides, addition reactions of HX and X_2, hydrations, reductions
5. ALKYL HALIDES
   - IUPAC naming, properties of alkyl halides, preparation from alkanes and alkenes, Grignard reagents, organometallic coupling
6. STEREOCHEMISTRY AT TETRAHEDRAL CENTERS
   - Chirality, optical activity, rules for specifying R and S configurations, diastereomers
7. REACTIONS MECHANISMS
   - Nucleophilic substitutions and eliminations reactions SN2, SN1, E2 and E1
8. AROMATICITY - BENZENE
   - Aromaticity, aromatic substitution, ortho- meta- para- directing groups

(4) TEACHING and LEARNING METHODS - EVALUATION

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

(5) ATTACHED BIBLIOGRAPHY

1. Organic Chemistry, Francis A. Carey - Robert M. Giuliano - Neil T. Allison - Susan L. Bane, Kritiki

2. Organic Chemistry, John McMurry, Crete University Press
3. Organic Chemistry for life sciences, David Klein, Utopia
4. Organic Chemistry with Biological Applications, John McMurry
5. Organic Chemistry, Robert T. Morrison, Robert N. Boyd
6. Organic Chemistry, Peter Vollhard & Neil Schore