האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

ORGANIC CHEMISTRY A - 64106

Last update 18-01-2024

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: School of Pharmacy

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra Ein Karem

Course/Module Coordinator: Prof. Avital Shurki

Coordinator Email: avital.shurki@mail.huji.ac.il

Coordinator Office Hours: Tuesday 12:00-13:00

Teaching Staff:

Prof Avital Shurki,
Ms. Salam Maree

Course/Module description:

The course provides students with basic knowledge in organic chemistry. The course includes terminology methods, the properties and important reactions of families with the following functional groups: alkanes, alkenes and Alkynes, Halo-alkanes and radicals. In addition the course covers conformers, stereoisomers and focues on the stereochemistry of the reactions.

Course/Module aims:

The course provides the students with basic knowledge of organic chemistry that will enable them to cope with understanding the synthesis, mechanisms of action, and formulation stability problems of drugs.

Learning outcomes - On successful completion of this module, students should be able to:

Identify functional groups and remember their most important reactions.
Examine an organic molecule and construct its systematic name.
Suggest reagents and plan a practical way to synthesize desired organic molecules.
Conclude which mechanism operates in a specific reaction and how it will affect the rate and the products.

Attendance requirements(%):

It is mandatory to participate in all lessons and exercises/tutorials. Participation in at least 80% of the lessons is mandatory to provide eligibility to do the exam.

Teaching arrangement and method of instruction: Lectures and exercises/ Tutorials

Course/Module Content:

• Delocalized Electrons and Resonance
• An Introduction to Organic Compounds - Nomenclature of Alkanes, Cycloalkanes ,Alkyl Halides, Ethers, Alcohol, and Amines, Physical Properties of Alkanes and other functional groups, Conformations of Alkanes and Cycloalkanes
• Alkenes and their reactions - Structure and Nomenclature, Stereoisomers of Alkenes, Introduction to reactivity, Thermodynamics and Kinetics, Electrophilic Addition Reactions of Hydrogen Halides, Water, Halogens, Borane and Hydrogen
• Stereochemistry - Chirality and Enanatiomers, Configurations of a Chiral Center (R,S), Optic Activity of Enantiomers, Stereochemistry of Electrophilic Addition

Reactions of Alkenes, Importance of Stereochemistry in Biological Systems and Drugs
• Alkynes and their reactions - Nomenclature and structure of Alkynes and Dienes, Nomenclature of molecules with more than one Functional Group, Electrophilic addition reactions of Alkynes, Synthesis using Acetylide Ions, Designing a Multistep Synthesis
• Reactions of Alkanes: Radicals - Chlorination and Bromination of Alkanes, The Reactivity of Radicals , Radical addition to Alkenes, Radical Substitution of Benzylic and Allylic Hydrogens
• Substitution and Elimination Reactions of Alkyl Halides - The Mechanism of SN1 and SN2 Substitution Reactions, The Mechanisms of E1 and E2 Elimination Reactions, Factors affecting the Kinetics and Stereochemistry of the reactions, Elimination and Double Eliminations in Alkanes and Alkynes Preparation.

Required Reading:
The course book is: Organic Chemistry, Paula Yurkanis Bruice.

Additional Reading Material:
Any book in Organic Chemistry

Grading Scheme:
Written / Oral / Practical Exam 91 %
Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 9 %

Additional information:
A set of Molecular Models is very much recommended

Each week there will be a brief quiz on material learned in previous lessons.

Assignments and quizzes must all be handed to be eligible to take the final exam.

A passing score in the final exam is required regardless of the quizzes/assignments in order to pass the course.

Having 10 assignments graded as "pass" will award the student with 4 points. Having less than 10 assignments graded as "pass" will not award the student with any point.

The average grade of the quizzes will be considered as 5% of the total grade unless the average quizzes grades is higher by 20 or more grade points compared to the

final exam, in which case the final grade will be only the grade of the final exam.