

## ORGANIC CHEMISTRY-I

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Chemistry	Organic Chemistry -I	1st	2nd	6	Compulsory
<b>LECTURER(S)</b>	<p><b>Postal address, telephone nº, e-mail address</b>  DEPARTAMENTO DE QUÍMICA FARMACÉUTICA Y ORGÁNICA.  Facultad de Farmacia.  Campus de Cartuja.  18071. GRANADA.  Phone: 958243843</p>				
<ul style="list-style-type: none"> <li>Olga Cruz López (<a href="mailto:olgacl@ugr.es">olgacl@ugr.es</a>; 958 240716)</li> <li>Mª José Pineda de la Infantas y Villatoro(<a href="mailto:mjpineda@ugr.es">mjpineda@ugr.es</a>, 958 249360)</li> <li>Juan Antonio Tamayo Torres (<a href="mailto:jtamayo@ugr.es">jtamayo@ugr.es</a>; 958 243846)</li> <li>Rosario María Sánchez Martín (<a href="mailto:rmsanchez@ugr.es">rmsanchez@ugr.es</a>; 958 246678)</li> <li>Francisco Franco Montalbán (<a href="mailto:ffranco@ugr.es">ffranco@ugr.es</a>; 958 240715)</li> <li>Juan José Díaz Mochón (<a href="mailto:juandiaz@ugr.es">juandiaz@ugr.es</a>; 958 715500, Ext 162)</li> <li>Mónica Díaz Gavilán (<a href="mailto:monicadg@ugr.es">monicadg@ugr.es</a>; 958 240726)</li> </ul>	<p><b>Tutorships:</b></p> <p><a href="http://www.ugr.es/~qfo/pdf/Tutorias2018-2019.pdf">http://www.ugr.es/~qfo/pdf/Tutorias2018-2019.pdf</a></p> <p>O. Cruz: M; 10:30-12:30 X,V; 9:30-11:30</p> <p>M.J. Pineda: L, J, V; 9:30-11:30</p> <p>J. Tamayo: M, X, V; 10:30-12:30</p> <p>R.M. Sánchez: L, M, V; 14:30-16:30</p> <p>F. Franco: M, J; 10:30-12:30 X; 9:30-11:30</p> <p>J.J. Díaz: L, M, V; 14:30-16:30</p> <p>M.Díaz: M, X, J; 9:30-11:30</p>				
<b>DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT</b>					
Pharmacy					
<b>PREREQUISITES and/or RECOMMENDATIONS (if necessary)</b>					
The student should have taken the previous Chemistry courses					
<b>BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE</b>					
Structure and stereochemistry of the organic compounds. Common analytical techniques used for the					



elucidation of the organic compounds. Alkenes, alkenes and alkynes, reactivity and synthetic methods.

#### **GENERAL AND PARTICULAR ABILITIES**

**Generic Abilities:** CG1

**Specific Abilities:** CEM1.3, CEM1.4, CEM1.5, CEM1.8 y CEM1.11

#### **OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)**

The student should be able to:

1. Understand and apply the knowledge comply in the subject.
2. Use the basic organic chemistry laboratory operations in order to synthesize, purify and structurally characterize simple organic molecules.

#### **DETAILED SUBJECT SYLLABUS**

TEORIC CHAPTERS:

- Chapter 1. **MOLECULAR CONSTITUTION**  
Main characteristic of carbon bonds. Multiple bond systems: aromaticity and conjugation.
- Chapter 2. **MOLECULAR CONFORMATION**  
Conformational Analysis. Cyclic and acyclic organic carbon chains.
- Chapter 3. **MOLECULAR CONFIGURATION: STEREOCHEMISTRY**  
Stereoisomerism: concept and classification of the organic compounds. Chirality. Optical activity. Absolute and relative configuration: The Cahn, Ingold and Prelog Rules. Molecules with several chiral centers. Optical isomers of cyclic compounds. Stereochemistry of carbohydrates. Stereochemistry of compounds without chiral centers. The importance of chirality in pharmacy.
- Chapter 4. **STRUCTURE ELUCIDATION OF ORGANIC COMPOUNDS BY PHYSICAL METHODS**  
Infrared spectroscopy. Mass Spectrometry. NMR spectroscopy: Theory and applications of the chemical shift. Coupling constants and their utility in the elucidation of the organic structure. Modern NMR techniques.
- Chapter 5. **SATURATED HIDROCARBONS: ALKANES**  
Classification of hydrocarbons: Alkanes: physical properties and natural sources. Synthesis and reactivity of alkanes. Halogenation of alkanes: radical substitution reaction on saturated carbons.
- Chapter 6. **UNSATURATED HIDROCARBONS: ALKENES**



Structure and physical properties. Synthesis of alkenes: Elimination reactions. Reactivity of alkenes: Addition reactions on double bonds. Oxidation reactions. Allylic substitutions. Conjugates dienes. Polymerization reactions.

- Chapter 7. **UNSATURATED HYDROCARBONS: ALKYNES**

Structure and physical properties. Acidity of acetylide. Synthesis and reactivity of alkynes.

**LABORATORY:**

- 1. Cannizzaro reaction on benzaldehyde.
- 2. Synthesis of acetanilide.
- 3. Synthesis of dibenzylideneacetone.
- 4. Synthesis of ethyl acetate.
- 5. Liquid-liquid extraction for the separation of organic mixtures.

**READING**

**BASIC BIBLIOGRAPHY:**

- C. VOLLHARDT, N.E. SCHORE. Química Orgánica: Estructura y Función. Ed. Omega. 3rd Edition, 2008.
- DAVID KLEIN. Química Orgánica. Ed. Médica Panamericana, 1st Ed. 2012.
- F.A. CAREY. Química Orgánica. Ed. McGraw-Hill. 6th Edition, 2006.
- L.G. WADE, Jr. Química Orgánica. Ed. Pearson, 9th Edition, 2017.
- T. W. GRAHAM SOLOMONS. Organic Chemistry. Ed. Wiley. 10th Edition, 2010.
- J. CLAYDEN, N. GREEVES, S. WARREN, P. WOTHERS. Organic Chemistry. Oxford University Press, 2001.

**COMPLEMENTARY BIBLIOGRAPHY:**

- J. MARCH. Advanced Organic Chemistry: Reactions, Mechanisms, and Structure, 7th edition Ed. Wiley, 2013.
- F. A. Carey; R. J. Sundberg. Advanced Organic Chemistry, Part A: Structure and Mechanisms  
Advanced Organic Chemistry: Part B: Reaction and Synthesis  
5th Edition, Ed Springer, 2007

**PROBLEMS**

- F. GARCIA CALVO-FLORES, J. A. DOBADO, Problemas resueltos de Química Orgánica, Ed. Thomson, 1st Ed, 2007.
- H. MEISLICH. Química Orgánica, (3rd Ed.). Ed. Mc Graw Hill-Interamericana, 2001.
- E. QUIÑOÁ y R. RIGUERA. Cuestiones y ejercicios de Química Orgánica. Una guía de autoevaluación (2nd Ed.) Ed. Mc Graw Hill 2004.

**NOMENCLATURE**

- W.R. PETERSON. Formulación y Nomenclatura. Química Orgánica. EUNIBAR.
- E. QUIÑOÁ, R. RIGUERA. Nomenclatura y representación de los compuestos orgánicos. Ed. Mc Graw-Hill, 2005.



## RECOMMENDED INTERNET LINKS

Chemistry Dictionary

ChemistryGuide

IUPAC Nomenclature of Organic Chemistry

Organic Syntheses

Organic-Chemistry

[Departamento de Química Farmacéutica y Orgánica \(UGR\)](#)

