

## ORGANIC CHEMISTRY –II

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Chemistry	Organic Chemistry-II	2 <sup>nd</sup>	1 <sup>st</sup>	6	Compulsory
<b>LECTURER(S)</b>			DEPARTAMENTO DE QUÍMICA FARMACÉUTICA Y ORGÁNICA. Facultad De Farmacia. Campus De Cartuja. 18071. GRANADA. Tfno. 958243843		
<ul style="list-style-type: none"> <li>- Juan Antonio Tamayo Torres (<a href="mailto:jtamayo@ugr.es">jtamayo@ugr.es</a>, 958 240709)</li> <li>- Luisa Carlota López Cara (<a href="mailto:lcarlotalopez@ugr.es">lcarlotalopez@ugr.es</a>, 958 243849)</li> <li>- Ana Conejo García (<a href="mailto:aconejo@ugr.es">aconejo@ugr.es</a>, 958 249583)</li> <li>- Mónica Díaz Gavilán (<a href="mailto:monicadg@ugr.es">monicadg@ugr.es</a>, 958 240726)</li> <li>- José Antonio Gómez Vidal (<a href="mailto:jagvidal@ugr.es">jagvidal@ugr.es</a>, 958 240719)</li> </ul>			<b>Tutorships</b> - Juan A. Tamayo: L, X y V: 10.30-12.30 h - L. Carlota López : L y X: 9.30-12.30 h - Ana Conejo: L, X y V: 9.30-11.30 h - Mónica Díaz: M, X y J: 9.30-11.30 h - José Antonio Gómez: M, X y J: 11.30-13.30 h		
<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>					
Synthesis and reactivity of functional groups. Heterocyclic chemistry					
<b>GENERAL AND PARTICULAR ABILITIES</b>					



**A. Generic Abilities: CG1**

**B. 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:

- Understand and apply the knowledge comply in the subject.
- 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. **AROMATIC HIDROCARBONS**. Classification. Physical and spectroscopic properties. Natural source. Electrophilic aromatic substitution. Aryl halides. Nucleophilic aromatic substitution.
- Chapter 2. **HALOGENATED DERIVATIVES**. Alkyl halides. Structure and physical properties. Synthesis. Unimolecular and bimolecular nucleophilic substitution. Allyl and vinyl halides. Organometallic compounds.
- Chapter 3. **ALCOHOLS, ETHERS AND PHENOLS**. Alcohols: structure and classification. Physical and spectroscopic properties. Natural source and synthesis. Chemical reactivity. Transpositions. Acyclic and cyclic ethers. Phenols. Phenolic ethers. Sulfur analogs: Thiols and sulfides.
- Chapter 4. **AMINES**. Structure. Physical properties. Synthesis. Chemical properties. Diazonium salts. Azo-colorants. Quaternary ammonium salts decomposition: Hofmann elimination.
- Chapter 5. **ALDEHYDES AND KETONES**. Structure. Physical and spectroscopic properties. Synthesis. Addition and addition-elimination reactions on carbonyl group. Wittig reaction. Reduction and oxidation reactions. Keto-enol tautomerism. Halogenation. Aldol condensation and related reactions. Unsaturated carbonyl compounds. Conjugate additions.
- Chapter 6. **CARBOXYLIC ACIDS**. Structure. Physical and spectroscopic properties. Synthesis. Acid-base reactions. Transformations to acid derivatives. Reduction, halogenation and decarboxylation reactions.
- Chapter 7. **CARBOXYLIC ACID DERIVATIVES**. Classification. Nomenclature. Physical properties. General reactivity of carboxylic acid derivatives. Claisen condensation and related reactions. Malonic ester synthesis. Acetoacetic ester synthesis.
- Chapter 8. **HETEROCYCLES**. Nomenclature.  $\pi$ -Electron rich heterocycles.  $\pi$ -Electron deficient heterocycles. Reactivity of heterocycles.

LABORATORY:



- 1. Synthesis of aspirin.
- 2. Synthesis of benzocaine.

## READING

### BASIC BIBLIOGRAPHY:

- C. VOLLHARDT, N.E. SCHORE. Química Orgánica: Estructura y Función. Ed. Omega. 3ª Edición, 2008.
- DAVID KLEIN. Química Orgánica. Ed. Médica Panamericana, 1ª Ed. 2012.
- F.A. CAREY. Química Orgánica. Ed. McGraw-Hill. 6ª Edición, 2006.
- L.G. WADE, Jr. Química Orgánica. Ed. Pearson, 7ª Edición, 2012.
- T. W. GRAHAM SOLOMONS. Organic Chemistry. Ed. Wiley. 10ª Edición, 2010.
- G.M. LOUDON. Organic Chemistry. Oxford University Press, 2002.
- 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, 7ª 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  
5 Edition, Ed Springer, 2007

### PROBLEMS

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



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

