
COURSE: ADVANCED ORGANIC CHEMISTRY module II

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Characterizing

TEACHER: Stefano Superchi

e-mail: **stefano.superchi@unibas.it**website: scienze.unibas.it/site/home.html.phone: +39 **0971206098**mobile (optional): +39 **3204371126**

Language: Italian

ECTS: 5 (4 lessons and 1
lab practice)n. of hours: 44 (32 h lessons
+ 12 h lab practice)Campus: Potenza
Dept. Science
Program: **Scienze Chimiche (LM
54)****Semester: I
From October 1st
2019 to January
20th 2020**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES*The goals of the course are:**Main educational goals (knowledge):*

- Principles of organic stereochemistry.
- Chiroptical spectroscopy (ORD, ECD, VCD).
- Determination of absolute configuration of chiral molecules.
- Determination of enantiomeric composition of not-racemic mixtures.
- Preparation of optically active compounds.
- Asymmetric syntheses.

The main learning outcomes will be:

- To project multi-step syntheses to obtain medium complexity organic molecules.
 - Propose possible mechanisms for stereoselective organic transformations.
 - Experimentally carry out synthetic procedures using enantioselective syntheses.
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PRE-REQUIREMENTS

- *Principles of Group Theory;*
 - *Structure of transition metals complexes*
 - *Reactivity of poly-functional organic compounds*
 - *Principles of spectroscopy (UV and NMR) and chromatography (HPLC)*
 - *Practice in the execution of simple lab syntheses of organic compounds*
 - *Practice in isolation, purification, and characterization of organic compounds*
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SYLLABUS*Lessons topics:*

1. Chirality and Optical activity, Stereoisomerism
2. Spectroscopic and chromatographic methods for determination of enantiomeric composition
3. Chiroptical spectroscopy (ORD, VCD, ECD): principles and applications
4. Methods for determination of absolute configuration
5. Preparation of optically active compounds: Resolution, diastereoselective and enantioselective syntheses.

Lab practice (12 h) at the end of the lessons:

6. Multi-step synthesis by reactions with enantioselective transformations.
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TEACHING METHODS*Theoretical lessons, Laboratory tutorials*

EVALUATION METHODSOral examination. Joined examination with the course of Advanced Chemistry module A.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

The teacher will provide didactic material through the e-learning platform.

Suggested reference books and textbooks:

- E.L. Eliel, S.H. Wilen, M.P. Doyle "*Basic Organic Stereochemistry*", Wiley-Interscience, 2001.
 - Ojima "*Catalytic Asymmetric Synthesis*" Wiley 2010.
 - L. Guo-Quian, Y. M. Li, A. S. C. Chan "*Principles and Applications of Asymmetric Synthesis*" Wiley, 2001.
 - R. E. Gawley, J. Aube "*Principles of Asymmetric Synthesis 2nd Ed*" Elsevier, 2012.
 - N. Berova, P. L. Polavarapu, K. Nakanishi and R. W. Woody "*Comprehensive Chiroptical Spectroscopy*" Volume 1 e 2, Wiley, 2012.
 - J. Clayden, N. Greeves, S. Warren "*Organic Chemistry 2nd Ed.*" Oxford University Press, 2012.
 - F. A. Carey, R. J. Sundberg "*Advanced Organic Chemistry - Part B 5th Ed.*" Springer, 2007.
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INTERACTION WITH STUDENTS*The teacher will receive the students on Monday 10.00- 12.00 and Thursday 10.00-12.00 in the teacher study (3A128, Science Department)*

EXAMINATION SESSIONS (FORECAST)¹

The same of the course of Advanced Chemistry module I.

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.