

COURSE: ADVANCED ORGANIC CHEMISTRY module II

ACADEMIC YEAR: 2016-2017

TYPE OF EDUCATIONAL ACTIVITY: Characterizing

TEACHER: Prof. Stefano Superchi

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Language: Italian

ECTS: 5 (5 lessons and 5 lab practice)

n. of hours: 48 (24 h lessons and 24 h lab practice)

Campus: Potenza
Dept. Science
Program:

Semester: 1st

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The goals of the course are:

Main educational goals (knowledge):

- Principles of organic stereochemistry.
- Chiroptical spectroscopy.
- 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 organic transformations through organometals and/or stereoselective.
- Experimentally carry out synthetic procedures using organometallic compounds and enantioselective syntheses.

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*

SYLLABUS

Lessons topics:

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

Lab practice (24 h)

6. Multi-step synthesis by reactions with organometallics and enantioselective transformations.

TEACHING METHODS

Theoretical lessons, Laboratory tutorials

EVALUATION METHODS

Oral examination. Exam moine with the course of Advanced Chemistry module A.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- 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. Aubé *"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.

INTERACTION WITH STUDENTS

The teacher will receive the students om Monday 10.00- 12.00 and Thursday 10.00-12.00 in the teacher study (3A128, Science Department)

EXAMINATION SESSIONS (FORECAST)¹

05/2/2018; 5/3/2018; 21/05/2018; 2/07/2018; 5/09/2018; 10/10/2018; 11/12/2018.

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

SEMINARS BY EXTERNAL EXPERTS YES ☐ NO ☒ X

FURTHER INFORMATION
