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**COURSE:** Advanced Organic Chemistry Mod.1

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**ACADEMIC YEAR:** 2019-2020

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**TYPE OF EDUCATIONAL ACTIVITY:** Characterizing

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**TEACHER:** Prof. Maria Funicello

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Language: **Italian**

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ECTS: (lessons e tutorials/practice) 5	n. of hours: (lessons e tutorials/practice) 44 (32 theoretical lessons and 12 laboratory tutorial)	Campus: <b>Potenza</b> Dept./School: <b>Dipartimento di Scienze</b> Program: <b>Chemistry (LM54)</b>	Semester: I (date)
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**EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES**

The student must demonstrate to know and understand first of all the problems related to the determination of a reaction mechanism in organic chemistry, also through studies of chemical kinetics; must also demonstrate through the knowledge of advanced organic reactions of knowing how to design the synthesis of aromatic and heteroaromatic rings. The student must be able to choose the best methodologies to realize the formation of new C-C bonds both simple and double. Finally, the student must have the ability to explain the choices made in a simple way and must be able to keep up to date continuously on his own.

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**PRE-REQUIREMENTS**

It is necessary to have acquired and assimilated the following basic concepts through the courses followed in the three-year course of study:

- Elementary concepts of chemical bonding, reaction speed, equilibria and energy factors
  - Main types of chemical reactions of organic compounds
  - Characterization methods and recognition of reaction products
  - Ability to analyze and design the synthesis of complex organic molecules.
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**SYLLABUS**

1. Study and description of organic reaction mechanism
  2. Aromaticity
  3. Theory of concerted reactions and Pericyclic Reactions: cicloadditions, electrocyclic reactions, sigmatropic rearrangements
  4. Principal C-C bond formation (single and double bond) by using transition metals as catalyst: Suzuki coupling and Sonogashira reaction; metathesis reaction.
  5. Synthesis of heterocycles
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**TEACHING METHODS**

The course is organized as follows:

- Classroom lectures on all course topics (32 hours)
  - Exercises in the Didactic Laboratory No. 3 of Organic Synthesis for a total of 12 hours (4 experiences of about 3 hours each)
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**EVALUATION METHODS**

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The objective of the test is to verify the level of achievement of the training objectives indicated above. The exam is integrated with module 2 of Advanced Organic Chemistry and involves the discussion of what has been done in the laboratory and a series of questions aimed at verifying the ability to connect and compare different aspects treated in the two modules.

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**TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL**

Carey. R.J. Sundberg, "Advanced Organic Chemistry"- Part A, Plenum Press London  
F.A. Miller, P.H. Solomon., "Writing Reaction Mechanism in Organic Chemistry", Academic Press,  
II ed.

I. Fleming, "Frontier Orbitals and Organic Chemical Reactions", J. Wiley and Sons, 2005

T. L. Gilchrist, R. C. Storr. "Organic Reactions and orbital symmetry", Cambridge University Press.

Recent scientific articles concerning metathesis reactions and those catalysed by Palladium will also be provided.

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**INTERACTION WITH STUDENTS**

Contact by mail and receiving by appointment on every day

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**EXAMINATION SESSIONS (FORECAST)<sup>1</sup>**

20/2/2020; 20/3/2020; 15/5/2020; 19/6/2020; 17/7/2020; 15/10/2020; 19/11/2020; 18/12/2020.

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**SEMINARS BY EXTERNAL EXPERTS**      YES     NO X

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**FURTHER INFORMATION**

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