

Chim/06 ADVANCED SPECTROSCOPY FOR STRUCTURAL STUDIES

Academic year: 2017-2018

Faculty: Department of Chemistry

Study courses: Master degree in Chemistry (Laurea Magistrale in Scienze Chimiche LM 54)

Study plans/Curricula: all curricula

Type: optional course

Total Credits: 4

Didactic Methods: Lectures

Didactic Period: march-june (second semester)

Exam type: oral

Professor in charge: Roberta Musio

Training objectives The aim of the course is to give an overview of the multidimensional NMR techniques used in the structural analysis of complex organic molecules and macromolecules (biopolymers, synthetic polymers, etc.).

Prerequisites bachelor in chemistry, pharmaceutical chemistry, material sciences

Didactic Methods lectures

Course programme

PROGRAMME:

Lectures: (32 h)

After a revision of the fundamentals of high resolution NMR Spectroscopy, the course will cover the following aspects:

1. quantum mechanical treatment of NMR spectroscopy
2. Theoretical aspects of 2D NMR spectroscopy: product operator formalism
3. Theoretical and a practical description of the most important 2D homo- and heteronuclear NMR techniques sequences (J-modulated spectroscopy, COSY, HETCOR, NOESY, HSQC, HMQC, INADEQUATE) used in the structural studies of organic molecules and macromolecules, with emphasis on what type of structural information the different NMR experiments yield.
4. Exercises on the elucidation of the structure of unknown organic compounds using combined NMR spectra (^{13}C , ^1H NMR, 1D and 2D)

Reference Texts

Material and textbooks provided by the teacher.