|  |
| --- |
|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Science and MathematicsDepartment of Chemistry |
| **GENERAL INFORMATION** |
| Study program  | **Chemistry** |
| Study Module (if applicable) | Research and development |
| Course title | Organic Structure Determination: an advanced course |
| Level of study | ☐ Bachelor ⊗ Master’s ☐ Doctoral |
| Type of course | ☐ Obligatory ⊗ Elective |
| Semester  | ☐ Autumn ⊗ Spring |
| Year of study  | second |
| Number of ECTS allocated | 5 |
| Name of lecturer/lecturers | Niko Radulović |
| Teaching mode |  ⊗ Lectures ☐Group tutorials ☐ Individual tutorials ⊗ Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The purpose of this course is to provide the student with a thorough understanding of the theory and use of two spectral techniques (NMR and MS) used to identify organic compounds and (2) to identify organic compounds by interpretation of spectral data. Proton and carbon-13 nuclear magnetic resonance spectroscopy (1D and 2D) will be studied and performed on a variety of organic compounds. The course will also cover several advanced NMR techniques like NOESY, 1H-1H COSY, HSQC, and HMQC. The goal of this course is also to emphasize the instrumental and practical nature of mass spectrometric instrumentation within the field of organic and bioanalytical chemistry. The topics of the course include fundamentals of ion motion, mass spectrometric instrumentation, applications to chemistry and biochemistry. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| This course is designed to introduce the techniques of both 1H and 13C NMR spectroscopy as powerful tools for structure elucidation in organic chemistry. A brief introduction to the principles of NMR spectroscopy will be followed by extensive analysis and discussion of NMR parameters such as chemical shift, coupling constants, splitting patterns, etc. The second half of the course on NMR is dedicated to the use of multi-pulse experiments (spin decoupling, NOE, APT, INEPT, DEPT etc.) and 2-dimensional techniques (COSY, NOESY, ROESY, etc.) in structure elucidation of complex organic molecules. The specific objectives of this course are to acquaint the student with basic aspects of mass spectrometry. The focus of the course on MS will be twofold. One part will concentrate on the interpretation of mass spectra, particularly the type of spectra generated by electron ionization (i.e, the spectra you might acquire from a typical GC/MS determination). The other part of the course will be a general survey of the different types of mass spectrometers, ionization techniques, and their applications in real world research problems. |
| **LANGUAGE OF INSTRUCTION** |
| ⊗ Serbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **10** | **Written examination** | **40** |
| **Practical teaching** | **10** | **Oral examination** | **10** |
| **Teaching colloquia** | **30** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |