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| **Study program** Applied chemistry with the management basics |
| **Course title** Methodology of scientific research (H253C) |
| **Name of lecturer/lecturers** Aleksandra N. Pavlović |
| **Type of course** Elective |
| **Number of ECTS allocated** 5 |
| **Course objectives**The aim of the course is to introduce students to the methodology of scientific research in chemistry, with importance of the use of scientific information and the basic principles of communication and publication of research results. |
| **Course outcomes**After successful completion of this course, the student is able to: - notice the difference between scientific and professional work,- use an adequate methodological approach in the research process,- independently collect, organize, and study the literature needed for writing a scientific paper, applying the acquired knowledge when using index databases and appropriate literature search services in electronic and paper form,- process, present research results and independently write a scientific paper with proper literature citation,- design and use visual means of presentation of scientific results,- respect the ethical norms of his activity and scientific practice. |
| **SYLLABUS***Lectures*Methodology of scientific research-introduction. Knowledge methods (modeling method, statistical method, method of analysis and synthesis, induction and deduction, experimental method, historical method, case method, empirical method, synthetic method). Elements of scientific knowledge: scientific facts, concepts, quantities categories, laws, principles, hypotheses, theories, scientific system. Procedure and stages of scientific research. Research structure. Scientific information-sharing. The library as a source of information. Cobson. Interlibrary loan. UDC number. Internet as a source of information. Measurement in research. Statistical data processing. Tabular and graphical presentation of results. Division of scientific papers. Periodical and non-periodical publications. Types of scientific meetings. Impact factor (IF). Structure of the original scientific work: title of the work, names of the authors, abstract, introduction, material and methods of the work, results of research, discussion, conclusion, acknowledgment, literature, attachment. Manuscript review. Evaluation scientific work through citation analysis. Curriculum vitae (CV) and summary. Methods of scientific results presentation. Technical preparation of the poster - Power Point. Designing and using visual aids. Scientific research projects. The ethical side of scientific research. Copyright. *Laboratory work*Scientific information: primary and secondary publications. The library as a source of information. Searching literature data in the library and on the internet. A study of existing literature. Hypothesis testing. Statistical data processing. Tabular and graphical display of results. Citation of literature. Writing a seminar paper on a given topic. Technical preparation and composition of posters. Designing and using a slide. Creating a CV. |
| **References**1. V. Milankov, P. Jakšić, Metodologija naučno-istraživačkog rada u biološkim disciplinama, Univerzitet u Novom Sadu, Prirodno-matematički fakultet, Departman za biologiju i ekologiju, Novi Sad, 2006.2. P. S. Veljović, Metode naučnog rada, Agronomski fakultet, Čačak, 2001.3. A. Pavlović, Snabdevanje naučnim dokumentima u Srbiji, Univerzitet u Beogradu, Univerzitetska biblioteka “Svetozar Marković”, Beograd, 2012.4. Z. Popović, Kako napisati i objaviti naučno delo, Akademska misao i Institut za fiziku, Beograd, 2004.  |
| **Active teaching classes** | **Lectures** 30 | **Laboratory work** 30 |
| **Teaching mode**Lectures, theoretical exercises, demonstration, seminar, consultation. |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| **Pre exam duties** | **Points** | **Final exam**  | **Points** |
| Activity during lectures | 5 | Written examination |  |
| Practical teaching | 20 | Oral examination | 30 |
| Teaching colloquia | 30 |  |  |
| Seminar | 15 |  |  |