

<b>Course title: Doctoral thesis (theoretical foundations)</b>		
<b>Teacher(s): Mentor</b>		
<b>Status:</b> Compulsory		
<b>ECTS credits: 30</b>		
<b>Prerequisites:</b> (Minimum) one published paper of the candidate in the field of doctoral thesis		
<b>Course objectives:</b>		
<ol style="list-style-type: none"> <li>1) Students are guided to recognize an existing problem (or a burning issue) in the specific scientific field, based on a previously conducted analysis and research, so that they can contribute to its solving.</li> <li>2) Students are prepared to conduct independent research within their doctoral thesis production.</li> <li>3) Supervised by their mentors, students are instructed to learn how scientific contribution is achieved, while at the same time being taught how to deploy complex scientific-research methods and instruments, and how to apply the acquired skills and knowledge in their work.</li> <li>4) The final goal is the scientific contribution, i.e. realization of a solution created as an outcome of the scientific research.</li> </ol>		
<b>Learning outcomes:</b>		
<p>Upon the completion of the course, the student is capable of:</p> <ol style="list-style-type: none"> <li>1) recognizing an existing problem (or a burning issue) in the specific scientific field, based on a previously conducted analysis and research, so that they can contribute to its solving. They are capable of using the normative rules in designing scientific methodology, drawing research hypotheses and describing the prospective research results. Also, they are capable of predicting the potential scientific contribution of their work. They acquire skills to approach a problem in an adequate manner, argue on their choices of tools and methods, design a research proposal within a timeframe, create tentative contents of their paper and the expected results, as well as deal with the relevant literature used in the research.</li> <li>2) conducting independent research in a chosen scientific field. The candidate is capable of searching for the relevant literature and resources, analyzing it and providing a review/summary of the contemporary scientific approaches and solutions to the problem.</li> <li>3) applying the basic principles of the scientific evaluation of the existing solutions</li> <li>4) predicts the shortcomings and benefits of such solutions, based on the preceding research methods.</li> </ol>		
<b>Course contents:</b>		
<b><i>Theoretical classes:</i></b>		
<p>After candidates pass all the examinations, they decide on their mentor, who is chosen upon the previous consultation with the PhD studies Committee. The mentor provides support for the candidates' IRP production, in laboratory conditions or in a research center/institute.</p>		
<b><i>Practical classes:</i></b>		
<p>Students conduct research within the scope of their scientific interest. The contents of their particular work depend on the selected field of scientific interest.</p> <p>Students are supposed to:</p> <ol style="list-style-type: none"> <li>1- identify a current problem within the specific scientific field of their choice, which they recognize as a potential topic for conducting independent research, along with elaborating on the results/goals of the potential research. <ul style="list-style-type: none"> <li>- Present a form of a novel scientific contribution (new model, new technology, new approach etc.)</li> <li>- Present research hypotheses and the potential research results.</li> <li>- List the basic methods of research they will use while solving a problem, and elaborate on their choice.</li> <li>- Describe the research design and the research phases, the use of research methods in certain parts of the research, with the timeframe of its finalization.</li> <li>- Elaborate on the tentative paper contents and its results (section levels in chapters as a minimum requirement, the third level in the hierarchy is desirable).</li> <li>- Select the resources and literature that will be used in the research.</li> </ul> </li> <li>2- demonstrate extensive knowledge and understanding of the problem that emerges in the specific scientific field they have been studying, so that they are able to write a review of the said issues in the specific scientific field, as well as the current solutions to the problem.</li> <li>3 - Provide an overall understanding of the said problems and solutions, and assess them critically and in an argumentative manner.</li> </ol>		
<b>Recommended Literature:</b>		
<p>[1] &lt;eng&gt;Saramäki, J.: How to Write a Scientific Paper: An Academic Self-Help Guide for PhD Students, Jari Saramäki, 2018&lt;/eng&gt;</p>		
Number of active classes: 0	Theoretical classes: 0	Practical classes - IRP: 20
<b>Teaching methods:</b>		

The Rulebook on Doctoral Studies of the University of Kragujevac contains detailed procedures for applying for a doctoral thesis. After consulting a potential mentor, the candidates submit a Doctoral thesis proposal (with a broader research topic) to the Scholarly Board. The council evaluates the suitability of the topic and appoints a mentor. After the topic proposal is approved, the student conducts research in a laboratory or a research center under the supervision of the mentor, using the literature list provided by the mentor. Periodically, in consultation with the mentor, the student's progress is checked and additional guidance is provided. If necessary, candidates conduct measurements and lab examinations, or statistical data analysis.

**Evaluation (maximum points 100)**

Conducted measurements and lab examinations - 50;

Documented verification of the conducted measurements and lab examinations – Doctoral thesis proposal approved - 50.