Zoran Mandić, Marijana Kraljić Roković	Electrochemistry and materials for electrochemical conversion and energy storage devices

Name of the course	**Electrochemistry and materials of electrochemical conversion and storage devices**
Number of instruction hours	20
Outline of course/module content	Fundamentals of electrochemical energy sources. Thermodynamics and kinetics of electrode reactions. Design and construction of batteries, fuel cells and supercapacitors. Active electrode materials and their characterization. Development of new electrode materials and composites for high specific energy/high power devices. Modelling and testing of electrochemical energy sources. Techniques for the investigation of electrode properties.
Description of instruction methods	The lectures will be held at the Faculty of Chemical Engineering and Technology. Additionally, a student is assigned a topic related to his/her PhD project, if possible. The topic needs to be researched, and the corresponding written (seminar) report needs to be submitted to the instructor for grading.
Description of course/module requirements	After the completion of the course a written and oral exam will be taken. A student is obliged to submit a written report on the assigned topic, to the instructor for grading. The report needs to be of a review-article type, based on the most relevant and recent literature findings related to the assigned topic. This, in general, assumes the student needs to read the topic-related literature extensively, and understand the findings reported in the literature.

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Electrochemistry and materials of electrochemical conversion and energy storage devices
1. To assess the possibility of applying certain materials for the electrochemical storage and conversion of energy 2. To implement conclusions about the properties of materials based on findings related to the thermodynamics and kinetics of electrode reactions. 3. To create electrochemical experiments for the synthesis and characterization of electrochemically active materials. 4. To analyse and interpret the data obtained in electrochemical experiments. 5. To design new advanced materials and technology that can be used in the development of electrochemical energy converters and storage devices. 6. To calculate characteristic values associated with electrochemical converters and storage devices based on data obtained by electrochemical measurements.