

Study program	Level of the study program		Second cycle	
	Name of the study program		Physics Education	
Course name	EDUCATIONAL RESEARCH FOR PHYSICISTS			
Course ID	Semester	Course status	ECTS credits	L+E
PED9621	I	MANDATORY	6	3+2
Lecturer	Prof. dr. Vanes Mešić			
Aims and intended learning outcomes	<p>The aim of this course is to develop students' competence to plan, conduct and evaluate educational research.</p> <p>Intended learning outcomes:</p> <ol style="list-style-type: none"> 1. Describe the defining features of the qualitative, quantitative and mixed research paradigm in educational research. 2. Describe effective approaches to identifying research problems and reviewing relevant literature. 3. Explain the most important concepts of descriptive and inferential statistics and perform simple calculations. 4. Identify the statistical tests that are appropriate for testing the given hypotheses. 5. Evaluate the assessment instruments that are often applied in physics education research. 6. Describe the various quantitative and qualitative methods that are used in physics education research and discuss the potential of given research designs. 			
Course content				
<p>Nature of research in physical and human sciences. Modern approaches to physics education research. Research problem. Location and review of relevant literature. Hypothesis in quantitative research. Descriptive statistics. Sampling and inferential statistics. Assessment instruments – examples from physics education research. Validity and reliability. Experimental research – examples from physics education research. Experimental research designs. <i>Ex post facto</i> research. Correlational research – examples from physics education research. Survey research. <i>Large-scale</i> studies in mathematics and science education research. Defining and designing qualitative research. Types of qualitative research. Analysing and reporting qualitative research – examples from physics education research. Action research.</p>				
Student workload (hours)		Grading		
Lectures and Exercises	75	Assessment method	Points	
Exam preparation	50	Partial exam	40	
Assignments	15	Research proposal	20	
Other	10	Final exam	40	
Total	150			
		Total	100	
Literature				
<ol style="list-style-type: none"> 1. Mužić, V. (2004). <i>Uvod u metodologiju istraživanja odgoja i obrazovanja</i>. Zagreb: Educa. 2. Kelly, A. E., & Lesh, R. A. (Eds.). (2012). <i>Handbook of research design in mathematics and science education</i>. Routledge. 3. Krüger, D., Parchmann, I., & Schecker, H. (2014). <i>Methoden in der naturwissenschaftsdidaktischen Forschung</i>. Berlin: Springer. 4. Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2018). <i>Introduction to research in education</i>. Boston: Cengage Learning. 5. Selected articles from physics education journals. 				
Remarks				