

<b>Study program:</b> Mathematics, Theoretical mathematics			
<b>Type and level of studies:</b> Master academic studies			
<b>Course unit:</b> Measure and Integration			
<b>The teacher in charge:</b> Assistant Professor, Suzana Aleksic			
<b>Language of instruction:</b> English			
<b>ECTS:</b> 10 (ten)			
<b>Prerequisites:</b> /			
<b>Semester:</b> <i>Winter Semester</i>			
<b>Course unit objective:</b> This course will be an introduction to abstract measure theory and the Lebesgue integral. We will define the Lebesgue integral, prove the main convergence theorems, and construct Lebesgue measure in $\mathbb{R}^n$ . Other topics include $L^p$ - spaces, Radon-Nikodym theorem, Lebesgue differentiation theorem and Fubini theorem.			
<b>Course unit contents</b>			
<b>Lectures:</b> Measure spaces and sigma-algebras, Operations on measurable functions (sums, products, composition), Borel sets, Real-valued measurable functions, Limits of measurable functions, Simple functions, Positive measures, Sets of measure zero, Completion of a sigma-algebra, Lebesgue measure on $\mathbb{R}^n$ , Caratheodory criterion, Cantor set, Definition of Lebesgue integral, Comparison of Lebesgue and Riemann integrals, Properties of positive measures, Elementary properties of the Lebesgue integral, Integral is additive for simple functions, Monotone convergence theorem, Integral is additive for all non-negative measurable functions, Fatou's lemma, Integral of complex functions, Dominated convergence theorem, Jensen's, Hölder and Minkowski inequalities, $L^p$ spaces, Inclusions between $L^p$ spaces, Measure decomposition theorems.			
<b>Practical teaching:</b> study research work			
<b>Literature</b>			
1. W. Rudin, <i>Real and Complex Analysis</i> , McGraw-Hill International Editions: <i>Mathematics Series</i> , McGraw-Hill Education - Europe, 1986.			
2. A.J. Weir, <i>Lebesgue Integration and Measure</i> , Cambridge University Press, 1973.			
3. V.I. Bogachev, <i>Measure Theory: Volume I and II</i> , Springer Verlag, 2007.			
<b>Number of active teaching hours</b>			<b>Other classes</b>
Lectures: 4	Practice: 2	Other forms of classes: mentoring system: 2	
<b>Teaching methods</b>			
Lectures in traditional manner using black board, discussions, consultation with the professor			
<b>Examination methods (maximum 100 points)</b>			
<b>Exam prerequisites</b>	<b>No. of points:</b>	<b>Final exam</b>	<b>No. of points:</b>
Student's activity during lectures	4	oral examinations	50
tests	46		
<b>Grading system</b>			
<b>Grade</b>	<b>No. of points</b>	<b>Description</b>	
10	91-100	Excellent	
9	81-90	Exceptionally good	
8	71-80	Very good	
7	61-70	Good	
6	51-60	Passing	
5	0-50	Failing	