

Study program: Mathematics, Theoretical mathematics				
Type and level of studies: Master studies				
Course unit: Measure and Integration				
Theacher in charge: Assistant Professor, Suzana Aleksic				
Language of instruction: English				
ECTS: 10 (ten)				
Prerequisites: Real analysis, Functional analysis				
Semester: <i>Summer Semester</i>				
Course unit objective: 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.				
Course unit contents				
Lectures: 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.				
Practical teaching: study research work				
Literature				
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.				
Number of active teaching hours				Other classes
Lectures: 4	Practice: 2	Other forms of classes: mentoring system: 2	Independent work: 0	
Teaching methods				
Lectures in traditional manner using black board, discussions, consultation with the professor				
Examination methods (maximum 100 points)				
Exam prerequisites		No. of points:	Final exam	No. of points:
Student's activity during lectures		4	oral examinations	50
tests		46		
Grading system				
Grade	No. of points		Description	
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	