COURSE NAME	**Measure and integral**					
Code	PMM913	Year of study	1st year of graduate study			
Course teacher	Nikola Koceić Bilan	Credits (ECTS)	6,0			
Associate teachers		Type of instruction (number of hours)	L	S	E	
			30		30	
Status of the course	Compulsory and elective	Percentage of application of e-learning	15			
COURSE DESCRIPTION						
Course objectives	Students will: - acquire a basic knowledge on measure theory -learn construction of a measure via an exterior measure -be introduced with the Lebesgue measure on R^n and its properties -be introduced with a notion of measurable function and its properties - gain insight in the theory of Lebesgue integration -learn to differ Riemann integral form the Lebesgue integral -learn to construct a product measure -learn to apply Fubini's theorem.					
Course enrolment requirements and entry competences required for the course	Course enrolment : Successfully completed courses Fundamentals of mathematical analysis and Set theory Entry competences : Students should be comfortable with using the following concepts: set operations, topology, topology and metric structure of R^n.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Upon successful completion of this course students will be able to: -explain notions of measure and measure space -construct a measure via an exterior measure applying Carathéodory's extension theorem -define the Lebesgue measure on R^n and to show its properties -differ non-measurable sets from measurable sets, especially from Borel sets on R -prove various properties of measurable functions -compute the integral of a measurable function -prove various properties of the Lebesgue integral - differ Riemann integral form the Lebesgue integral - construct a product measure -apply Fubini's theorem.					
Course content broken down in detail by weekly class schedule (syllabus)	- (Borel) Sigma algebra on a set (on a toplogical space). Measure. (2) - Exterior measure. Carathéodory's extension theorem. (4) - Lebesgue exterior measure. (3) -Lebesgue measure on R^n .(1) - (Non-measurable) sets, Borel sets on R. (1) -Cantor set and Cantor function. (1) -Complete measure. Extension of measure to complete measure. (2) -Measurable functions (1) - Properties and examples of measurable functions. (2) -Integral of a non-negative measurable function. Fatou's lemma. (3) -Integral of measurable function. (2) -Properties of the Lebesgue integral. Dominated convergence theorem. (3) -Integration on a measurable set. Comparation of the Lebesgue and Riemann integral. (2) - Product measure. Fubini's theorem. (3)					
Format of instruction	Lectures and exercises.					
Student	Attending classes. Students are expected to be present at least 70% of classes.					

responsibilities	
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Attending classes: 2 ECTS. Partial exams/Written exam: 2 ECTS Final exam: 2 ECTS.
Grading and evaluating student work in class and at the final exam	Two partial written exams / one final written exam and final oral exam. There are 2 partial written exams during a semester. Passing both partial exams enables students to take an oral exam. Successfully passing the oral exam leads to successful completion of the course. Final grade is derived as the arithmetic mean of scores in partial exams (or a written exam) and the oral exam. In the case of failure in partial exams or the oral exam students must undergo a written exam before taking oral exam again. Written exam consists of practical and theoretical exercises.
Required literature (available in the library and via other media)	Dragan Jukić, *Uvod u teoriju mjere i integracije*, Osijek, 2008.
Optional literature (at the time of submission of study programme proposal)	S. Mardešić, *Matematička analiza u n-dimenzionalnom realnom prostoru II*, Školska knjiga, Zagreb, 1977. W. Rudin, *Principles of Mathematical Analysis*, Mc-Graw Hill, New York, 1964. N. Antonić, M. Vrdoljak, *Mjera i integral*, PMF-Matematički odjel, Zagreb, 2001..
Quality assurance methods that ensure the acquisition of exit competences	Summarizing test results and conducting an anonymous student survey at the end of the course. The survey is conducted according to the rules of the University of Split.
Other (as the proposer wishes to add)	