NAME OF THE COURSE	Mathematical methods of physics I					
Code	87598 (PMP107)	Year of study	2nd year of BSc study			
Course teacher	Prof. Dr. Leandra Vranješ Markić Assist. Prof. Dr. Petar Stipanović	Credits (ECTS)	6			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			45		30	
Status of the course	Obligatory	Percentage of application of e-learning	10%			

COURSE DESCRIPTION

Course objectives	To teach students to use methods of vector and tensor analysis as well as probability and statistics in analysis and solving of physics problems.
Course enrolment requirements and entry competences required for the course	Calculus in one variable
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Understanding the physical interpretation of differential vector operators. Ability to use the vector analysis in rectangular and curved coordinates to formulate and solve physics problems, mostly in mechanics and electrodynamics. Understanding of the basic tensor analysis. Understanding and the ability to use basic concepts and methods in probability and statistics. Understanding and correct interpretation of data and the ability to perform simple statistical analysis.
Course content broken down in detail by weekly class schedule (syllabus)	Vector analysis. Gradient. Divergence. Curl. Vector integration. Gauss's Theorem. Stokes Theorem. Gauss's law and Poisson's Equation. Dirac Delta Function. Vector analysis in curved coordinates. Circular Cylinder Coordinates. Orthogonal Coordinates. Differential Vector Operators. Spherical Polar Coordinates. Introduction to Tensor Analysis. Contraction and direct product. Quotient Rule. Elements of the probability theory: random events, dependence and independence. Elements of statistical reasoning: samples, binomial, Poisson, Gauss and gamma distribution. Statistical estimation of parameters. Testing statistical hypothesis.
Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☒ partial e-learning ☐ field work ☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Active participation during class attendance.

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)*					
Class attendance	2	Research		Practical training	
Experimental work		Report		Independent work and exam	4
Essay		Seminar essay		(Other)	
Tests		Oral exam		(Other)	
Written exam		Project		(Other)	

Grading and evaluating student work in class and at	Colloquia and final exam.

the final exam			
Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. L. Vranješ Makrić, Skripta iz matematičkih metoda fizike I, lecture notes, 2009.		moodle web page
	2. Presentations in probability and statistics		moodle, web
Optional literature (at the time of submission of study programme proposal)	1. K. F. Riley, M. P. Hobson, S. J. Bence, Mathematical methods for physics and engeneering. 2. H. J. Weber , G. B. Arfken, G. Arfken, Essential Mathematical Methods for Physicists, Academic Press, 2003.		
Quality assurance methods that ensure the acquisition of exit competences	- following the success of students in colloquia and exam - following the student success in the following exams and the connection to the success of this course - student surveys		
Other (as the proposer wishes to add)			