NAME OF THE COURSE	Data Analysis in High Energy Physics				
Code	PMP272	Year of study	2		
Course teacher	Toni Šćulac, PhD, assistant professor	Credits (ECTS)	6		
Associate teachers	Marko Kovač, PhD, assistant professor	Type of instruction (number of hours)	L	S	E	F
			30	0	30	0
Status of the course	COMPULSORY	Percentage of application of e-learning				

COURSE DESCRIPTION	
Course objectives	Teaching students basics of data analysis in high energy physics.
Course enrolment requirements and entry competences required for the course	Introduction to elementary particles.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students are expected to: - Understand and describe how LHC works - Understand basics of the Standard Model - Explain the workflow of data analysis - Know how to work with the ROOT programming package - Understand probability theory: frequentist and Bayesian - Understand Monte Carlo simulation - Explain particle interactions with matter - Explain estimators, likelihood, maximum likelihood, and extended maximum likelihood method - Explain confidence intervals and know how to determine them for different estimators - Explain Neymann and Bayesian confidence intervals - Explain hypothesis testing and p-value
Course content broken down in detail by weekly class schedule (syllabus)	1. LHC physics and the Standard Model 2. Data analysis in HEP 3. ROOT programming package 4. Probability and statistics 5. Monte Carlo simulations in HEP 6. Distributions and estimators 7. Likelihood, maximum likelihood and extended maximum likelihood methods 8. Confidence intervals 9. Hypothesis testing and p-value
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	Attend at least 70% of lectures and 70% of exercises.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of*						
	Class attendance	2	Research		Practical training	2
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	

ECTS credits is equal to the ECTS value of the course)	Tests		Oral exam	1	(Other)	
	Written exam	1	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The final grade is formed after the student passes both test parts: - written exam (problem solving on computer, 50% rating) and - oral exam (theory, 50% rating).

	Title	**Number of copies in the library**	**Availability via other media**
Required literature (available in the library and via other media)	Statistical Data Analysis, Oxford Science Publications, 1st edition, Glen Cowan		

Optional literature (at the time of submission of study programme proposal)	Slides from lectures.
Quality assurance methods that ensure the acquisition of exit competences	Anonymous student questionnaire and course evaluation performed by the University of Split.
Other (as the proposer wishes to add)	