Program	Level of studies		First cycle	
	Program name		**Physics**	
Course name	**SPECIAL THEORY OF RELATIVITY**			
Course ID	Semester	Course status	ECTS credits	L+E
PTH6511	**VI**	**MANDATORY**	**5**	**2+2**
Lecturer	**Prof. dr. Elvedin Hasović**			
Aims and intended learning outcomes	The goal of the course is to provide students with basic knowledge about relativistic phenomena in mechanics, electrodynamics and optics. At the end of the course the student should be able to: -understand the basic principles of the theory of relativity; -apply the Lorentz transformations; -understand and apply the concept of the four-vector; - solve numerical problems in the field of theory of relativity.			

Course content
Introduction to the theory of relativity. Galilean transformations. Experimental foundations of special theory of relativity. Postulates of the special theory of relativity and their direct consequences. Lorentz transformations. Consequences of the Lorentz transformations. Length contraction and time dilation. The law of velocity addition. Relativistic Doppler effect. Interval and the proper time. Lagrange equations. Relativistic dynamics of the particle. Mass, energy, and momentum in the theory of relativity. Invariance of physical laws in contrast to the Lorentz transformations. The concept of a four-vector. A four-vector formulation of the theory of relativity. Four-vector of position, velocity and momentum. Maxwell theory in relativistic form. Four-vector of current and potential. Equation of continuity. Electromagnetic Field Tensor. Maxwell equations.

Student workload (hours)		Grading	
Lectures and Exercises	60	Assessment method	Points
Exam preparation	65	Course Test	50
Total	120	Final Exam	50
		Total	100

Literature

1. Lecture Notes.
2. N. Hasić, *Specijalna teorija relativiteta*, Svjetlost, Sarajevo, 1983
3. G. Knežević, *Zbirka zadataka iz specijalne teorije relativnosti*, Sarajevo : Prirodno-matematički fakultet, 2003
4. R. Resnick, *Introduction to Special Relativity*, John Wiley & Sons NY, 1968.

Remarks