Study program	Level of the study program		First cycle	
	Name of the study program		Educational Physics	
Course name	EVOLUTION OF PHYSICAL THEORIES			
Course ID	Semester	Course status	ECTS credits	L+E
PHY8311	**VIII**	**ELECTIVE**	**3**	**2+0**
Lecturer	**Prof. dr. Vanes Mešić**			
Aims and intended learning outcomes	The aim of this course is to further develop the students' understanding about the evolution of physics, from the rise of the mechanical view to development of quantum physics. Intended learning outcomes: 1. Describe and interpret the evolution of selected physical theories. 2. Analyse the nature of scientific discovery within the context of development of specific physics concepts and theories. 3. Relate the development of ideas throughout history of physics with the development of corresponding ideas in an individual.			

Course content
The rise of the mechanical view– part 1 (Vectors. Motion). The rise of the mechanical view– part 2 (The heat concept). The rise of the mechanical view– part 3 (Molecular-kinetic theory. The philosophical background of the mechanical view). The decline of the mechanical view - part 1 (Electric fluid. Magnetic fluid). The decline of the mechanical view – part 2 (Light as substance. Velocity of light. The color concept). The decline of the mechanical view – part 3 (The wave concept. Wave theory of light. Ether and the mechanical view). The field concept and relativity – part 1 (Field as representation. The reality of the field. Field and ether). The field concept and relativity – part 2 (Ether and motion. Time, distance and relativity). The field concept and relativity – part 3 (Relativity and mechanics. Time-space continuum). The field concept and relativity – part 3 (General relativity. Geometry and experiments). Quantum physics – part 1 (Continuity and discontinuity. Elementary quanta). Quantum physics– part 2 (Electromagnetic spectrum. Waves of matter). Quantum physics – part 3 (Probabilistic laws. Physics and reality). Current challenges. Theory of everything.

Student workload (hours)		Grading	
Lectures and Exercises	30	Assessment method	Points
Exam preparation	25	Partial exam	40
Assignments	15	Seminar paper	20
Other	5	Final exam	40
Total	75		
		Total	100

Literature

1. Supek, I. (1995). *Filozofija, znanost i humanizam.* Zagreb: Školska knjiga
2. Einstein, A., & Infeld, L. (1967). *The evolution of physics: the growth of ideas from early concepts to relativity and quanta*. NY: Touchstone.
3. Torretti, R. (1998). The Philosophy of Physics. Cambridge: CUP.

Remarks