Study program	Level of studies		**First cycle**	
	Study program name		**Physics Education**	
Course name	**HISTORY OF PHYSICS**			
Course ID	Semester	Course status	ECTS credits	L+E
PHY6311	**VI**	**MANDATORY**	**3**	**2+0**
Lecturer				
Aims and intended learning outcomes	The goal of this course is to cover the history of natural science. Special attention is devoted to presenting the development of the most important physics principles from the deepest past to the present days in chronological order. At the end of the course the student should be able to understand how some of the essential concepts and laws of physics developed in a historical context.			

Course content

History of sciences in early cultures (5000-600 BC). Babylonia. Egypt. Phoenicia. India. China and the Far East. Ionia and Early Greece. Greek mathematics. Greek astronomy. Greek physics and philosophy. The growth of experiment. Schools in ancient Greece. Thales. Anaximander. Pythagoras. Eudoxus. Aristotle. Anaxagoras. Empedocles. Democritus. Mathematics, physics and astronomy in Alexandria. Euclid. Archimedes. Hero of Alexandria. Diophantus. Aristarchus of Samos. Eratosthenes. Hipparchus. Ptolemy. Science in the Early Middle Ages. Al-Hazen. Al-Kwarizmi. Al- Biruni. Avicenna. Roger Bacon. Maricourt. Occam. Buridan. The mean speed theorem. Kinematics (Merton College, 14-th century).
The birth of modern science (15-th and 16-th century). Copernicus. Copernican heliocentrism. Brahe. Bruno. Mechanics, hydrostatics, optics, and magnetism. Stevinus. Del Monte. Tartaglia. Della Porta. Maurolico. Gilbert. The birth of a new physics (17-th century). Galilei. Kepler. Descartes. Leibniz. Huygens. Newton. Newton's law of motion and law of gravitation. Optics in the 17-th century.
Mechanics in the 18-th and 19-th century. The origins of analytic mechanics. Euler. J. Bernoulli. D'Alembert. Lagrange. Hamilton. Celestial mechanics. Laplace. Optics in the 18-th and 19-th century. Wave nature of light. Young. Fresnel. Atomic theory of matter. Avogadro's law. Energy and thermodynamics. Carnot. Mayer. Joule. Lord Kelvin. Helmholtz. Clausius. Boltzmann. Electricity. Franklin. Coulomb.The electric current. Galvani. Volta. Electrochemistry. Electromagnetism. Ørsted. Ampère. Ohm. Faraday. Lentz. Hertz. EM induction. Maxwell electrodynamics. EM waves.
The Michelson-Morley experiment. The Lorentz transformations. Einstein. The theory of relativity. Modern physics. Atomic and nuclear physics. X- radiation. Radioactivity. The electron. The structure of the atom. Rutherford. Other particles. Quantum theory. Bohr. Planck. Heisenberg. The principle of uncertainty. De Broglie. Pauli. Schrödinger. Dirac. Fermi. Astrophysics. Other developments in modern physics.

Student workload (hours)		Grading	
Lectures and Exercises	30	Assessment method	Points
Exam preparation	20	Course Test	50
Total	50	Final Exam	50
		Total	100

Literature

1. Lecture Notes.
2. J. Jeans, The growth of physical science, reprint of first ed., Cambridge University Press, Cambridge, 2009.
3. Ž. Dadić, Povijest ideja i metoda u matematici i fizici, prvo izdanje, Školska knjiga, Zagreb, 1992.
4. Z. Faj, Pregled povijesti fizike, drugo izdanje, Sveučilište JJ Strossmayer, Osijek, 1999.
5. I. Supek, Povijest fizike, treće izdanje, Školska knjiga, Zagreb, 2004.
6. Muhamed Busuladžić, Historija fizike I, first edition, PMF, Sarajevo, 2008.

Remarks

Continuous knowledge and skills assessment will be carried out through midterm exams (written tests). Final examination can also be an oral exam. The successful completion of the course implies achieving at least 55% of the total number of points in both the partial and final exam.