Program	Level of studies		First cycle	
	Program name		Educational Physics	
Course name	SOLID STATE PHYSICS I			
Course ID	Semester	Course status	ECTS	L+E
PCM5611	**VII**	**MANDATORY**	**6**	**2+2**
Lecturer	**Doc. Dr. Maja Đekić**			
Aims and intended learning outcomes	Course objective is to familiarize students with phenomena and physical laws of solid state matter. Learning outcomes: 1. Understands basic laws in solid state 2. Independently solves problems from this field 3. Understands thermal properties of solid state			

Course content
INTRODUCTION. Historic introduction into solid state physics. Crystalline and amorphous solids. Ideal crystal. Crystal lattice and base. Bravais lattice. Simple crystal structures. Miller indices. Reciprocal lattice. X-ray diffraction. Bragg's law. Atomic scattering factor. Structure factor. TYPES OF BONDS IN CRYSTAL-ionic, covalent, metal, van der Waals. DEFECTS IN CRYSTAL-Real crystal. Classification of defects. Equilibrium concentration of Schottky and Frenkel defects. Deformations of solids. Dislocations. CRYSTAL LATTICE DYNAMICS- Harmonic approximation. Lattice vibrations of one-dimensional crystal. Chain of identical atoms. Chain of two types of atoms. Dispersion relation. Phonon. THERMAL PROPERTIES OF SOLIDS- specific heat of classical crystal-Dulong-Petit law. Quantum theory of specific heat- Einstein and Debye. Thermal expansion of solids. Thermal conductivity of solids. FREE ELECTRON MODEL IN METALS-Free electron gas in a box. Free electron gas statistics. Heat capacity of free electron gas. Thermoelectric emission. ELECTRICAL PROPERTIES OF SOLIDS-Electric conductivity-Ohm's law. Scattering of electrons. Thermal conductivity of metals. Hall effect. MODEL OF ENERGY ZONES IN SOLIDS- Introduction.

Student workload (hours)		Grading	
Lectures and Exercises	60	Assessment method	Points
Exam preparation	90	Test	50
Assignments		Final exam	50
Consultation			
Total	150	Total	100

Literature

1. C.Kittel “Uvod u fiziku čvrstog stanja”Savremena administracija Beograd, 1970 godine
2. M. Pirić “Osnove kvantne mehanike, statističke fizike i fizike čvrstog stanja”, Univerzitetska knjga Sarajevo 2007. godine
3. V. Šips “Uvod u fiziku čvrstog stanja”, Školska knjiga Zagreb 1991. godine

Remarks