Course Unit Descriptor

Study Programme: Mechanical Engineering; Clothing Engineering; Environmental Engineering; Information Technology; Informatics and Technics in Education

Course Unit Title: Technical Physics

Course Unit Code: OAS95

Name of Lecturer(s): Professor Vjekoslav Sajfert, PhD

Type and Level of Studies: Bachelor Academic Degree

Course Status (compulsory/elective): Elective

Semester (winter/summer): Summer

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 6

Prerequisites: None

Course Aims:

Physics forms the basis of many other sciences as well as of innovative technical and industrial developments. In the bachalor's degree programme Technical Physics, students build on the knowledge acquired in the previous knoledge and extend their skills in solving physics problems and mathematical problems so that they can work on research-related and practical questions.

Learning Outcomes:

Technical physics is an algebra based physics course designed to utilize modular concepts to include: motion, forces, torque, work energy, heat wave/sound, and electricity. Results of physics education research and physics applications in the workplace are used to improve the student's understanding of physics in technical areas. Upon completion, students will be able to define motion and describe specific module concepts; understand the nature of contact forces and distinguish passive forces; work cooperatively to set-up laboratory exercises; and demonstrate applications of module-specific concepts.

Syllabus:

Theory

Vectors; Motion; Force; Newton's Laws; Friction; Simple Machines; Statics; Gravity and Weight; Momentum; Work and Energy; Power; Temperature and Heat; Wave Motion and Sound; Basic Harmonic Motion; Light Waves; Lenses and Optical Instruments; Physics of the Atom; The Atomic Nucleus: Nuclear Energy

Practice

Problem solving; Experimental exercises

Required Reading:

1. A Beiser, *Theory and Problems of Applied Physics*, McGraw Hill, 2004.
2. F. Bueche, D.L. *Wallach Technical physics*, Wiley 2007.
3. V. Sajfert, *Fizika*, TF "M. Pupin", Zrenjanin, 2003
4. V. Sajfert, *Zbirka zadataka iz fizike*, TF "M. Pupin", Zrenjanin, 2003

Weekly Contact Hours: 5	**Lectures:** 3	**Practical work:** 2

Teaching Methods:

Lectures and students group work

Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	**Final exam**	points
Active class participation	10	written exam	20
Test I and Test II	40	oral exam	20
Preliminary exam(s)			
Seminar(s)	10		