Course Unit Descriptor

Study Programme: Production engineering
Course Unit Title: Properties and selection of materials
Course Unit Code: P2502
Name of Lecturer(s): Rajnović Dragan, Šiđanin Leposava, Baloš Sebastian
Type and Level of Studies: Master
Course Status (compulsory/elective): elective
Semester (winter/ summer): winter+summer
Language of instruction: english
Mode of course unit delivery (face-to-face/distance learning): face-to-face
Number of ECTS Allocated: 5
Prerequisites: none
Course Aims:. Acquiring knowledge in the field of scinece and materials and materials used in mechanical engineering.
Learning Outcomes: Acquired knowledge is used for establishing connections between characteristics and contemporary materials characteristics and application of materials in various mechanical parts and cosntructions.
Syllabus. Microplastic deformation and strengthening mechanisms: solid strengthening, work hardening, precipation hardening and dispersion strengthening, strengthening by phase transformation, grain size. Anneling - general effects, recovery and recristalization, analysis and prevention of engineering failures, elastic and plastic deformation form continuum and microscopic viewpoint, linear and non linear fracture mechanisms fracture mechanisms of metals ceramics and composites. Microscopic description of fracture modes. Micro and macro aspects of fracture during static or slowly applied load at room and elevated temperature. Creep fatique, wear and environmentally influenced failure for metals, ceramics and composits.
Required Reading: Hertzberg R.W. : Deformation and Fracture Mechanics of Engineering Materials, John Wiley and sns, inc, 1996 Ashby, Michael F. : Materials Selection in Mechanical Design, Amsterdam: Elsevier. 2011

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

Teaching Methods: Lectures are realized interactively through lectures, auditory, laboratory and computer practical classes. In lectures theoretical part is presented with characteristic examples for better understanding of subject content. In auditory practical classes, characteristical exercises are covererd. Acquired knowledge is practically applied in laboratory practical classes using avalilable laboratory equipment. Apart from lectures and practical classes, consultations are held regularly.
Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			