

Course Unit Descriptor

Study Programme: Agricultural Engineering And Information Systems		
Course Unit Title: Mechanical and agricultural materials		
Course Unit Code: 19.PTI002		
Name of Lecturer(s): Assistant professor Milivoj Radojčin, assistant Krstan Kešelj		
Type and Level of Studies: Undergraduate studies		
Course Status (compulsory/elective): Compulsory		
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: 7		
Prerequisites: None		
Course Aims: Introducing the theoretical basis, characteristics and practical application of various metallic and non-metallic materials in engineering, especially in mechanical engineering.		
Learning Outcomes: Training students for the evaluation of materials and material selection for installation on agricultural machines and devices.		
Syllabus: Theory The importance of mechanical materials in terms of exploitation of agricultural techniques. Structure metals and alloys, the crystallization process. The crystal lattice. Deformation. The formation of alloys: mechanical mixtures, solid solutions and chemical compounds. The state diagram multicomponent alloys. Iron and its alloys. The state diagram iron-carbon. The classification of steels. Fundamentals of heat treatment of carbon steel. Classification and properties of cast iron. Non-ferrous and light metals. Non-metallic materials mechanical engineering. Properties and material testing. The importance of knowing the characteristics of agricultural materials. Basic physical properties. The mechanical properties. Rheological properties. The current features. Specifics of friction agricultural materials. Heat, electrical, optical and acoustic properties. Practice Mechanical Materials: State diagram Fe-Fe ₃ C. Marking metals and alloys by JUS. Crystallographic observation. Introduction to the principles of testing properties of metals and alloys. diagram strain deformations. Introduction to the thermal treatment in practice - visit the factory. Agricultural amterijali: Laboratory exercises test the basic physical properties. Laboratory exercises test the mechanical properties. Laboratory exercise test circuits feature. Laboratory exercises test the friction properties. Demonstration exercise of the optical properties of materials.		
Required Reading:		
Weekly Contact Hours:	Lectures:	Practical work:
Teaching Methods:		

Lectures: Theoretical teaching is conducted using a computer presentation with oral presentation. Complete authorized lectures are offered to students in the Faculty website.

Practical classes: Practical classes are used for clarifying material from lecturers, organized demonstration and laboratory experiment.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	60
Practical work		oral exam	35
Preliminary exam(s)		
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.