

Study program / course: Mechanical Engineering				
Type and level of study: Bachelor academic studies				
Course: Basic Bioengineering				
Lecturers: Nenad D. Filipovic, Gordana Jovicic				
Status of course: Obligatory for module M ₅ , V semester				
Number of ECTS: 6				
Precondition: Mechanics I, Mechanics II, Mathematics I, Mathematics II, Fluid mechanics, Thermodynamics				
The objective of course Objective of course is introducing of students with basic bioengineering in this way that they can participate themselves in teams for smaller bioengineering projects. Also students can better understand and connect basic engineering disciplines with medicine, biology and chemistry.				
The outcome of course After this course and final exam from Basic Bioengineering, students will be able to understand the contents of courses which rely on the basic bioengineering principles. Students should understand basic functional cardiovascular systems, respiratory systems, mechanical tissue properties, skeletal muscle structure, cartilage biomechanics and to be capable to do own experimental design in bioengineering.				
Syllabus Theoretical study Basic principles in bioengineering. Mathematical methods in biology. Blood flow properties. Cardiovascular systems. Respiratory systems. Blood rheology. Bioviscoelastic solids. Mechanical tissue properties. Skeletal muscles. Heart muscle. Smooth muscles. Cartilage mechanics. Spine biomechanics. Basic experimental design in bioengineering. Experimental tissue properties.				
Practical classes Practices, Research study. Experimental study: Tissue parameter identification by using uniaxial and biaxial stretch system.				
Recommended reading (in Serbian) 1. Filipovic, N., Modeling and simulation of cardiovascular system, WUS Austria, University of Kragujevac, 2005. 2. Filipovic, N., Basic Biomechanics, manuscript, Faculty of Mechanical Engineering, Serbia, 2008. 3. Kojic, M., Slavkovic, R., Zivkovic, M., Grujovic, N., Finite element methods I, Linear analysis, Faculty of Mechanical Engineering, 1998.				
The number of hours of active teaching:				Other classes: 1
Theory: 3	Practical classes: 1.6	Other forms of teaching: 0.4	Research study: 0	
Methods of teaching				
Evaluation of knowledge				
Pre-final exam obligations	points	Final exam		points
Activities during the classes:	10			
Practical classes:				
Colloquiums(s) :		Final exam		60
Seminar(s) :	30			