UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION			
Study Program	Mechanical Engineering		
Study Module (if applicable)	-		
Course Title	Analysis and simulation in biomechanics		
Level of Study	☐ Bachelor	☐ Master's	☒ Doctoral
Type of Course	☐ Obligatory	☒ Elective	
Semester	☐ Autumn	☒ Spring	
Year of Study	II		
Number of ECTS Allocated	10		
Name of Lecturer/Lecturers	Miroslav D. Trajanović		
Teaching Mode	☒ Lectures	☐ Group tutorials	☐ Individual tutorials
	☒ Laboratory work	☒ Project work	☒ Seminar
	☐ Distance learning	☐ Blended learning	☐ Other

Purpose and Overview (max. 5 sentences)

Human body or its particular segments may be observed as biomechanical systems. The aim of the course is to introduce students to the principles of kinematic and dynamic simulation and stress analysis of biomechanical systems. The course is practical, example-driven. The accent is put on simulation of mechanical behavior of human musculoskeletal system, with or without orthopedic fixators or implants.

Syllabus (brief outline and summary of topics, max. 10 sentences)

- *Principles of gate analysis.*
- *Advanced modeling of biomaterials for use in FEA.*
- *Subject-specific stress analysis of segments of musculoskeletal system, based on FEM.*
- *Parametric studies and optimization of shape and position of medical fixators and implants.*
- *Analysis and simulation in stomatology.*
- *Analysis and simulation in various branches of medicine.*
- *Student project: stress analysis and/or kinematic and dynamic simulation of mechanical behavior of given biomechanical system.*
- *Typical elements of a scientific paper related to analysis and simulation in biomechanics. Writing a paper for the scientific conference.*

Language of Instruction

☒Serbian (complete course) ☒ English (complete course) ☐ Other _____ (complete course)

☐Serbian with English mentoring ☐Serbian with other mentoring _____			
Assessment Methods and Criteria			
Pre exam Duties	**Points**	**Final Exam**	**Points**
Activity During Lectures	**5**	**Written Examination**	**0**
Practical Teaching	**0**	**Oral Examination**	**25**
Teaching Colloquia	**70**	**Overall Sum**	**100**
***Final examination mark is formed in accordance with the Institutional documents**			