UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION	
Study program	Mechanical Engineering
Study Module (if applicable)	-
Course title	Mechanisms and Machines
Level of study	☒Bachelor ☐ Master's ☐ Doctoral
Type of course	☐Obligatory ☒ Elective
Semester	☒Autumn ☐Spring
Year of study	III
Number of ECTS allocated	6
Name of lecturer/lecturers	Nenad D. Pavlović, Miloš Milošević
Teaching mode	☒Lectures ☒Group tutorials ☐Individual tutorials ☒Laboratory work ☒Project work ☐Seminar ☐Distance learning ☐Blended learning ☐Other

PURPOSE AND OVERVIEW (max. 5 sentences)

The purpose of this course is to gain some basic knowledge for designing new, modern mechanisms of machines and devices and improving existing mechanisms solutions, by integration of structural and kinematic analysis and synthesis of mechanisms of machines. Students should gain the ability to use methods of analysis and synthesis of mechanisms for realizing appropriate functions at devices and machines.

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

- Kinematics of Mechanisms: Position, Velocity and Acceleration Analysis of planar Linkages, Cams, Planetary Gear Trains, Differentials, Step mechanisms and High Ratios Speed reducers (Cycloidal Drive and Strain Wave Gearing), by application of analytical, numerical and graphical methods, as well as contemporary softwares; graphical synthesis of linkages – type, number and dimensional synthesis (Function Generation, Motion Generation);
- Dynamics of linkages: Kinetostatics, Inertia forces and Moments of Inertia, Balancing.

The material is processed through concrete examples of mechanisms of machines and devices from different fields of technology and is illustrated with filmed records of existing solutions of mechanisms and machines, functional models as

well as software animations. Students get acquainted with the possibilities of modern software in the field of modeling 3D assemblies of mechanisms, their kinematic and dynamic analysis, integration with programs that use the finite element method for the analysis of stress states of links of the mechanisms kinematic chains and other forms of simulation of mechanisms functioning in real conditions.

- Laboratory work: measurement of kinematic and dynamic parameters in real conditions (measuring of velocity, acceleration, force, torque, as well as balancing of rotors).

LANGUAGE OF INSTRUCTION

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

☒Serbian with English mentoring ☒Serbian with German mentoring

ASSESSMENT METHODS AND CRITERIA

Pre exam duties	**Points**	**Final exam**	**points**
Activity during lectures	**10**	**Written examination**	
Homework	**10**	**Oral examination**	**Max. 40**
3 Teaching Colloquia	**Max. 40**	**OVERALL SUM**	**100**

***Final examination mark is formed in accordance with the Institutional documents**