UNIVERSITY OF NIŠ

Course Unit Descriptor	**Faculty**	Faculty of Mechanical Engineering

GENERAL INFORMATION

Study Program	Mechanical Constructions, Development and Engineering
Study Module (if applicable)	-
Course Title	Tools and Technologies in Product Development
Level of Study	☐ Bachelor ☒ Master's ☐ Doctoral
Type of Course	☒ Obligatory ☐ Elective
Semester	☒ Autumn ☐ Spring
Year of Study	I
Number of ECTS Allocated	7
Name of Lecturer/Lecturers	Dragan S. Milčić, Mijajlović M. Miroslav
Teaching Mode	☒ Lectures ☒ Group tutorials ☐ Individual tutorials ☒ Laboratory work ☒ Project work ☐ Seminar ☐ Distance learning ☐ Blended learning ☐ Other

Purpose and Overview (max. 5 sentences)

Students acquire knowledge in application of various CA technologiesin product development. The aim of the subject is that the students can independently use CA computer technologies (CAD, CAM, CAE, RP,VR) in the product development process.

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

Definition of product development. Phases of product development. The role of computers in product development. Product Life cycle. Effects of using CAx tools in product development. Hardware development. Input-output devices which are used in product development. Software used in product development. Information systems. CAD as basic tool in product development. Geometric modelling. Modelling of Products. Visualization and interaction. Rapid Prototyping (RP) and Rapid Manufacturing. CAD / CAM. Simulation (CAE). Finite Element Method (FEM). Deformation method.Definition of finite element. Classification of elements. Stiffness matrix.Governing equations. FEM modelling. Pre-processing - Generation of finite element mesh,Definition of loads and constraints, Post processing. Discretization error. Static structural analysis. Modal analysis, Integration of CAx tools in product development. Systems based on knowledge (Knowledge Systems). Optimization in product development. FMEA / FMECA (Failure Mode and Effects Analysis / Failure Mode, Effects and Criticality Analysis) methods in product development. FTA (Fault Tree Analysis) method in product development.

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**	50
Practical Teaching	5	**Oral Examination**	40
Teaching Colloquia	–	**Overall Sum**	100
*Final examination mark is formed in accordance with the Institutional documents			