UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	

GENERAL INFORMATION	
Study program	Mechanical engineering
Study Module (if applicable)	
Course title	PLASTIC DEFORMATION TECHNOLOGY
Level of study	☒ Bachelor ☐ Master's ☐ Doctoral
Type of course	☐ Obligatory ☒ Elective
Semester	☒ Autumn ☐ Spring
Year of study	Seven
Number of ECTS allocated	6
Name of lecturer / lecturers	Saša Ranđelović
Teaching mode	☒Lectures ☐Group tutorials ☐ Individual tutorials ☒ Laboratory work ☒ Project work ☐ Seminar ☐ Distance learning ☐ Blended learning ☐ Other

PURPOSE AND OVERVIEW (max. 5 sentences)

Education of students to determine the basic parameters of the technology of plastic deformation of metals (degree of deformation, stress state, deformation forces and work, measuring tools) in a volume deformation and shaping sheet metal. Generation of non-linear adaptive FEM model to simulate the deformation process. Qualifying students for the analysis and design process of deformation and generation of simulation models for the identification of the critical parameters.

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

Theory: 1. The term deformation law const. dies, 2. Defining the curves hardening and method determination, the impact of temperature and strain rate, 3. Theory of stress and strain, stress tensor, strain tensor, strain rate 4. Theory and conditions of plasticity, geometric meaning, Equations stress and strain affilation 5. Methods for determining deformation forces and work, common solving equations of equilibrium and conditions of plasticity 6. Method deform. work and non-linear FEM methods 7. The methods of bulk metal forming, compress and strip of finite and infinite length, process simulation, FEM model, 8 Forward extrusion, determining pressure, def. forces and work, process simulation, FEM model, 9. Forward extrusion of hollow elements, def. forces and def. work, process simulation, FEM model, 10

Backward extrusion, def. forces and def. work, process simulation, FEM model, 11. Combined extrusion, forces and def def. work, process simulation, FEM model, 12 Forging, power and deform. work, the number of strikes, 13 Sheet metal forming. balance equations, plastic conditions 14. The deep drawing ration. deformations, stress and, power of extracts. In the first operation. 15. The next operation. Deformations, strees, def. force 16. Deep drawing with reductions, deformations, strees, force and def. work , simulation of the process, FEM model, 17. Bending, type of process, 18. Elastic plastic bending, stress, strain. 25. Purely plastic bending, stress, strain.

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	**10**	**Written examination**	**30**
Practical teaching	**30**	**Oral examination**	**30**
Teaching colloquia	**10**	**OVERALL SUM**	**100**

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