MM3411

Study program / course: Mechanical engineering

Type and level of study: Master academic studies

Course: Unconventional processing methods

Teachers: Bogdan Nedić

Status of course: Elective for module M_1, III semester

Number of ECTS: 6

Precondition: none

The objective of course

Enable students for calculations and analyses with aim to check techno-economical justification of using certain processing method. Present and explain basic unconventional processing methods.

Generate new knowledge of UPN, facilities, machinery, working fluids, tools etc. Demonstrate some processing methods and point to the important elements from aspects of right choice. Learn about basic characteristics of UPN technologies and train students to apply new knowledge for design of new products and technologies for production of tools for volume shaping and cutting of metal sheets.

The outcome of course

Student will become capable to: design technologies for making complex surfaces, design technologies for manufacture of tools with complex configuration for forging, shedding, plastic masses and rubber processing etc., and choose technologies for cutting, merging and deforming.

Syllabus

Theoretical study

Course consists of several subsections:

- basics of unconventional processing methods
- electrochemical processing - ECM,
- electro-erosive processing – EDM, EDM with full electrode, EDM with wire electrode
- ultrasonic processing EUS
- electron beam processing EBM
- laser beam LBM
- plasma jet processing PJM
- chemical processing CM
- processing by explosion
- abrasive jet processing electromagnetic processing, metal sheet processing,
- combinations of different methods
- comparison of UPN and characteristics of obtained surfaces

Practical classes: *Practice, other forms of lectures, research projects*

During laboratory practice students are becoming capable to choose and define technologies and methods of manufacture and to choose working parameters, learn machines and other equipment with goal to buy and service them. During research projects students will be enabled to conduct basic research in the area of the course

Recommended reading

1. Lazić, M.: Nekonvencionalni postupci obrade, Mašinski fakultet, Kragujevac, 1980

The number of hours of active teaching:				Other classes:
Theory: 3	Practical classes: 1.4	Other forms of teaching: 0.6	Research study: 0	1

Methods of teaching

Evaluation of knowledge

Pre-final exam obligations	**points**	**Final exam**	**points**
Activities during the classes:	**10**		
Practical classes:	10+20=**30**	Oral exam	**30**
Colloquiums(s) :	15+15=**30**		
Seminar(s) :			