UNIVERSITY OF TUZLA UNIVERZITET U TUZLI

SYLLABUS

1. Course title:

Non-conventional Machining Processes

2. Code:

3. Cycle of study:

I

4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

No prerequisites

7. Class restrictions:

No restrictions

8. Duration / semester(s):

1 | 8

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2) (for two-semester courses)		Workload: (hours)
	8			
9.1. Lectures	2		Classes:	22,50
9.2. Seminars	0		Individual work:	60,96
9.3. Laboratory / Practice classes	0		In total:	83,46

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Manufacturing Engineering, Mechanical Production Engineering

12. Lecturer:

Adnan Mustafić, PhD

13. Course aims:

The main objective of the subject "Non-conventional Machining Processes" is to acquire advanced knowledge in the field of non-conventional machining and the justification of their production application, especially in the processing of "exotic" or hard-to-cut materials and complex forms.

14. Learning outcomes:

The acquired knowledge should enable proper design of non-conventional machining processes for a specific or concrete production problem. For the selected type of process with the acquired knowledge, it is possible to properly design the non-conventional technology, the choice of the most convenient processing regimes and the ability to manage the entire process.

15. Course content:

1. Introductory lectures, familiarization of students with the course, syllabus, methods of work, grading, etc.
2. Current research status in the field of unconventional material removal processes, especially from the standpoint of improving output technological characteristics of the process;
3. Justification for the application of unconventional machining processes;
4. Abrasive jet machining;
5. Water jet machining;
6. Ultrasonic machining;
7. Electrical discharge machining (EDM);
8. Partial knowledge assessment;
9. Laser machining;
10. Electron beam machining and plasma machining;
11. Chemical and electrochemical machining;
12. Innovation of existing and possibilities for applying newly developed unconventional machining processes;
13. Development directions of combined unconventional machining processes (hybrid processes), either among themselves or in combination with conventional processes;
14. Public defense of project/seminar papers in the form of a presentation;
15. Partial knowledge assessment

16. Learning methods:

In order of successful learning within the subject the following activities are planned:
- Lectures - theoretical lectures, active two-way communication student - teacher, the obligatory presence of students; segment of active participation in the teaching of students will include and deal with a given topic by the student and public defense of the same.
- Exercises;
- Tests
- Seminar work - independent work of students
- Consultations.

17. Assessment methods:

After the mid-semester point, students take the first written midterm exam, covering the material taught up to that point. The midterm consists of theoretical questions. The maximum number of points a student can earn on the first midterm is 20.
At the end of the semester, students take the second written midterm exam, which also consists of theoretical questions and tasks, covering the material taught after the first midterm. A maximum of 20 points can be earned. Both midterms are prepared by the course instructor, ensuring that students can respond to the given questions within the allotted time. All students take the tests simultaneously to ensure consistency in the level of knowledge being tested and fairness in exam conditions.
As part of the pre-exam requirements, students are required to complete an individual seminar paper on a selected topic related to the course content. The seminar paper is submitted in written form for review and evaluation by the instructor, followed by an oral presentation and a Q&A session on the topic.
• A presented and approved seminar paper can earn up to 10 points.
• Mandatory attendance and participation in lectures and exercises can earn up to 5 points.
• The final and retake exams are oral, and students can earn up to 45 points.
Student knowledge assessments are recognized as a cumulative exam if the student scores at least 50% of the possible points in each individual assessment component.
To pass the course, a student must accumulate a minimum of 54 points in total.

Grading System: (5) + (10) + (40) + (45) = 100 points

Grade	Description	Letter Grade	Points Achieved
5 (five)	"unsatisfactory	"F,FX"	< 54 points
6 (six)	"sufficient"	"E"	54–64 points
7 (seven)	"good"	"D"	65–74 points
8 (eight)	"very good"	"C"	75–84 points
9 (nine)	"excellent"	"B"	85–94 points
10 (ten)	"outstanding"	"A"	95–100 points

18. Assessment components:

Grading will be based on the following activities:
• Attendance in lectures = 5 points
• Seminar paper + classroom participation = 10 points
• Tests = 40 points
• Pre-exam obligations = 55 points
• Final exam = 45 points
Total = 100 points

19. Mandatory reading list:

1. Milkić, D.: Nekonvencionalni postupci obrade, Mašinski fakultet u Novom Sadu, 2002.
2. Gostimanović, M.: Nekonvencionalni postupci obrade, 2012.

20. Additional reading list:

1. El-Hofy, H.A.: Advanced Machining Processes McGraw-Hill Mechanical Engineering Series, 2002.

21. Web sources:

www.avxhome.se/ebooks/engeneering_technology/0071453342Processes.html,
www.avxhome.se/ebooks/engeneering_technology/2014-12-08-13_201412,

22. Applicable from the academic year:

23. Adopted in the Faculty/Academy session: