SYLLABUS

1. Course title:

Jigs, Clamping and Cutting Tools

2. Code:

3. Cycle of study:

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4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

No prerequisites

7. Class restrictions:

No restrictions

8. Duration / semester(s):

1 6

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)
9.1. Lectures	2		Classes:	33,75
9.2. Seminars	1		Individual work:	56
9.3. Laboratory / Practice classes	0		In total:	89,75

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Manufacturing Engineering, Mechanical Production Engineering

12. Lecturer:

Adnan Mustafić, PhD

13. Course aims:

Adopt basic knowledge about cutting and clamping tools: function, design and construction and their application.

14. Learning outcomes:

Based on the subject matter, the student will acquire basic professional-theoretical knowledge in calculation, construction and application of clamping and cutting tools and successfully solve practical tasks on practical jobs and further advancing in the profession and occupation.

15. Course content:

1. Introductory lectures, introduction of students to the course, syllabus, and methods of work, grading, etc.
2. Design and calculation of elements of clamping tools and auxiliary devices;
3. Accuracy calculation of clamping and auxiliary devices;
4. Design of special clamping and auxiliary devices;
5. Design of universal devices;
6. Aggregate auxiliary devices;
7. Auxiliary clamping tools for CNC (numerically controlled) machine tools;
8. Partial knowledge assessment;
9. Auxiliary devices for machining on aggregate machine tools;
10. Standardization and typification of new tools and devices;
11. Types of cutting tools and their application;
12. Design characteristics of cutting tools;
13. Special tools for chip removal machining;
14. Tool monitoring in operation and their improvement;
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 of the theory and problems - solving tests and problems;
- Seminar work - independent work of students in solving the above problem,
- 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 and problem-solving tasks. 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.
During auditory exercises, students solve problems and numerical examples related to the lecture topics. In seminar exercises, students complete a semester project involving the design of a fixturing system.
• 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. Tanović, Lj., Jovičić, M.: Alati i pribori, projektovanje i proračun konstrukcija, Mašinski fakultet u Beogradu, 2011. godine
2. Ekinović S.: Rezni alati i pomoćni pribori, Univerzitet u Zenici, Mašinski fakultet, Zenica, 2007.

20. Additional reading list:

1. Vukelja, D., Mišković, A.: Konstrukcija alata za obradu rezanjem, Univerzitet "Džemal Bijedić", Mašinski fakultet, 1983.
2. Mehta, N., K.: Metal Cutting and Design of Cutting Tools, Jigs, and Fixtures, McGraW Hill Education, 2015.
3. Venkataraman, K.: Design of Jigs, Fixtures and Press Tools, Springer Nature, 2021.

21. Web sources:

https://www.scribd.com/document/42695921/Tool-Engineering-Jig-and-Fixture-Book [17.4.2025]
https://www.cncsolutions.ch/assets/partner/Cncsolutions/SK-Welt-der-Spanntechnik.pdf [17.4.2025]
https://uk.misumi-ec.com/eu/incadlibrary/detail/000123.html [17.4.2025]

22. Applicable from the academic year:

23. Adopted in the Faculty/Academy session: