

SYLLABUS

1. Course title:

Contemporary Materials

2. Code:

3. Cycle of study:

I

4. ECTS credits:

3

5. Type of course:

Elective

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester(s):

I
IV

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)
	3	<input style="width: 40px; height: 20px;" type="text"/>		
9.1. Lectures	3	<input style="width: 40px; height: 20px;" type="text"/>	Classes:	33,75
9.2. Seminars	0	<input style="width: 40px; height: 20px;" type="text"/>	Individual work:	55,83
9.3. Laboratory / Practice classes	0	<input style="width: 40px; height: 20px;" type="text"/>	In total:	89,58

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

Energy and thermo-fluid engineering, Production engineering, Mechatronics

12. Lecturer:

Dr. sc. Džemal Kovačević, Assistant professor

13. Course aims:

The aim of the course is to transfer knowledge from the field of modern materials to students, so that they can master new processes and new technologies for obtaining new materials and applications. Training in selecting the most appropriate material and manufacturing method for specific conditions.

14. Learning outcomes:

Based on the knowledge acquired during the attending the cases, students will be able to distinguish new materials according to their properties and specifics. Learn about the methods of production and processing technology for new materials. Analyze and know how to choose which material is most applicable for different products.

15. Course content:

1. Introduction to new and contemporary materials, concept, applications, manufacturing methods, special features.
2. Characteristics and selection of materials, Ashby diagrams.
3. Ceramic materials.
4. Polymeric materials.
5. Composite materials, Composite materials reinforced with particles and fibers.
6. Metal foams, Metallic glasses (amorphous metals).
7. Smart materials.
8. First partial test.
9. Materials and parts obtained by powder metallurgy.
10. Special steels: alloy steels.
11. Special steels: stainless steels.
12. Superalloys.
13. Non-ferrous metals: Copper, Chromium, Nickel, Lead and Zinc and their alloys, light metals.
14. Methods of testing polymeric materials.
15. Second partial test.

16. Learning methods:

Lectures, seminar papers, consultations, interactive communication with course participants, company tour.

17. Assessment methods:

The concept of knowledge assessment is based on continuous work with students during the semester. Knowledge assessment methods include: knowledge assessment through partial exams during class, creation of seminar papers as well as final exam in written and/or oral form. This allows all students who have different affinities one treatment (written and/or oral knowledge test)

18. Assessment components:

Evaluation will be based on the following activities:

Pre-examination requirements

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|--|------------|
| - Written partial test I | 20 points. |
| - Written partial test II | 20 points. |
| - Assignments, project paper / graphic works | 15 points. |

Total pre-exam requirements	55 points.
Final exam	45 points.

Total maximum	100 points.
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Grading scale is as follows:

Grade	Descriptive	Letter	For the number of points achieved
5 (five)	"does not meet the minimum criteria"	"F,FX"	<54 points
6 (six)	"meets the minimum criteria"	"E"	54-64 points
7 (seven)	"generally good, but with significant shortcomings"	"D"	65-74 points
8 (eight)	"average, with noticeable errors"	"C"	75-84 points
9 (nine)	"above average, with some errors"	"B"	85-94 points
10 (ten)	"exceptional success with no errors or with minor errors"	"A"	95-100 points

19. Mandatory reading list:

1. Sreto Tomašević: "Dizajniranje tehničkih materijala", Apeks Zenica, 1999.
2. Mirsada Oruč: "Savremeni metalni materijali", Fakultet za metalurgiju i materijale Zenica, 2005.

20. Additional reading list:

1. Fuad Čatović: "Nauka o materijalima" - Novi materijali, Mašinski fakultet Mostar, 2001.

21. Web sources:

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| <ol style="list-style-type: none">1. https://scispace.com/journals/contemporary-materials-19u9dc532. https://www.asme.org/topics-resources/content/9-material-discoveries-that-could-transform-manufacturing3. https://www.dezeen.com/2024/12/11/top-material-innovations-2024/ |
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22. Applicable from the academic year:

2025/2026

23. Adopted in the Faculty/Academy session:

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