# SYLLABUS

**1. Course title:**

BASICS OF MATERIAL ENGINEERING

**2. Code:**

**3. Cycle of study:**

1

**4. ECTS credits:**

3

**5. Type of course:**

○ Mandatory ◉ Elective

**6. Prerequisites:**

No prerequisites

**7. Class restrictions:**

No class restrictions

**8. Duration / semester:**

1 5

**9. Weekly contact hours:**

| | |
|---|---|
| 9.1. Lectures: | 2 |
| 9.2. Seminars: | 0 |
| 9.3. Laboratory/Practice classes: | 1 |

**10. Faculty:**

Faculty of Technology

**11. Department/study program:**

Chemical Engineering and Technologies/Chemistry and Engineering of Materials

**12. Lecturer:**

Sabina Begic, associate professor

**13. Lecturer's e-mail:**

sabina.begic@untz.ba

**14. Web site:**

www.tf.untz.ba

**15. Course aims:**

1. Acquiring knowledge about the types of materials, their use, properties and characteristics that are important in engineering.
2. Understanding the relationship between the inner structure and the properties of metal, ceramic, polymeric and composite materials.
3. Getting acquainted with the techniques and mechanisms that change the structure of technical materials and control the mechanical, electrical and thermal properties.

**16. Learning outcomes:**

After completing the course, students will be able to:
1. Distinguish the structure of different types of material
2. Analyze the mechanical and electrical properties of the material
3. Choose materials for different engineering applications
4. Determine the cause of deformation in the materials and prevent them from occurring

**17. Course content:**

Classification of materials; Contemporary materials; Structure of crystalline solid matter; Irregularities in solid materials; Diffusion; Mechanical properties of metal; Dislocation and strengthening mechanisms; Deformation; Phase Diagrams; Phase transformations in metals; Application and processing of metal alloys; Structure and properties of ceramic materials; Application and processing of ceramic materials; Polymeric constructions; Characteristics, application and processing of polymers; composites; Corrosion and degradation of materials; Electrical, thermal, magnetic, and optical properties; Choice of materials and design considerations; Economic, environmental and social issues in material engineering.

**18. Learning methods:**

Lectures with the use of multimedia resources, active learning, preparation and presentation of group seminar papers.

**19. Assessment methods:**

Testing of students' knowledge is carried out by the following methods: tests, seminar work and final exam.
After half of the semester, students take the first writing test, which includes previously treated topics from lectures. The test consists of tasks of simple recollection. Each correct answer is scored with 2 points, ie the student can score up to 20 points on the first test. In the last week of the semester, students take the second writing test, which includes previously treated topics from lectures from the second part of the semester. Each correct answer is scored with 2 points, ie the student can score up to 20 points on the second test. All students take both tests on the subject at the same time, thereby achieving uniformity of the level of knowledge that is being tested, as well as the conditions under which the student takes the exam. As part of the prerequisites, students are required to prepare group seminar work that will cover a specific topic from the content of the subject. Seminar in writing is submitted to the subject teacher for review and evaluation, and then presented orally. In the preparation and presentation of group seminar work all the students of the group participate, whose participation is valorized individually. For the prepared and presented seminar work, the student can achieve 0 to 10 points.
The final exam is in written form and consists of questions that cover the entire course. The maximum number of points a student can earn on a written exam is 50.
Checks on all forms of knowledge are recognized as a cumulative exam. In order for a student to pass a subject, he must have a minimum of 54 cumulative points.

**20. Assessment components:**

The grade at the exam is based on the total number of points the student has obtained by fulfilling the pre-requisites and passing the exam according to the quality of the acquired knowledge and skills, and it contains a maximum of 100 points and is determined according to the following scale:

| Student obligations | Points |
|---|---|
| First test | 0-20 |
| Second test | 0-20 |
| Seminar paper | 0-10 |
| Final Exam | 0-50 |

**21. Required reading list:**

1.Mitchell B.S. (2004) An Introduction to Materials Engineering and Science for Chemical and Materials Engineers. NJ: John Wiley & Sons
2.Callister W. D. (2000) Materials Science and Engineering: An Introduction. 7th edition. NJ: John Wiley & Sons

**22. Web sources:**

**23. Applicable starting from the academic year:**

2015/2016

**24. Adopted in the Faculty/Academy session:**