

SYLLABUS

1. Course title:

Physical and Chemical Characterization of Materials

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course: Mandatory Elective**6. Prerequisites:**

Physical chemistry

7. Class restrictions:

None

8. Duration / semester:

1

6

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:

Dr.Sci. Indira Šestan, assistant professor

13. Lecturer's e-mail:

indira.sestan@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

Introduction to the structure and physical and chemical aspects of the science of materials. Enabling students to understand and interpret the basic physical and chemical properties of material by using the appropriate techniques for characterization.

16. Learning outcomes:

After successful completion of this course, the student will be able to:

- perform compaction of the resulting material,
- perform the characterization of the resulting material using the appropriate techniques,
- examine physical and chemical properties and match the resulting properties with the structure and the morphology of the material.

17. Course content:

Defining materials and their classification. The chemical, physical, electrical and optical properties of materials (solubility, flammability, stability, density, viscosity). Introduction to characterization and identification, the structure relation of the material properties. Characterization methods: material preparation/sample diffraction method (X-ray diffraction, electron diffraction, neutron diffraction), microscopic methods, spectroscopic methods, X-ray spectroscopy, transport measurements, magnetic measurements, resonance techniques, techniques including elementary particles, the thermal analysis (DSC, DMA, TGA), mechanical measurement. Characterization of solid materials.

18. Learning methods:

- Interactive lectures, using multimedia resources,
- Preparation and presentation of individual papers of lab sessions (compared to individual characterization techniques),
- Consultation.

19. Assessment methods:

Assessment by tests, exams and practical work in the laboratory. During the pre-exam obligations the student is required to do a seminar paper and to do two partial exams that contain the suitable issues. During the semester the student will have two tests in theoretical part. Each test carries 25 points. The final exam carries a maximum of 35 points.

20. Assessment components:

The exam grade is based on the total number of points which the student acquire by completing pre-exam requirements and passing the exam, according to the quality of the acquired knowledge, and contains maximum of 100 points, and is determined as follows:

Student's obligations	Points
Colloquium	10
Test in theoretical part	50 (25 points each test (minimum number of points to pass 13))
Attendance	5
Final exam	35

21. Required reading list:

- Ranogajec J.: Metode karakterizacije materijala, UNS, TF, 2005,
- Ristić Momčilo: Principi nauke o materijalima, Srpska akademija nauka i umetnosti, Beograd, 1993,
- Flawitt E.J. Peter, R.K. Wild: Physical Methods for Materials Characterization,
- Joel Gersten and Frederick Smith: The Physics and Chemistry of Materials, John Wiley & Sons, Inc. New York, 2001.

22. Web sources:

(max. 687 characters)

23. Applicable starting from the academic year:

2015/2016.

24. Adopted in the Faculty/Academy session: