

SYLLABUS

1. Course title:

WASTE MATERIALS OF INDUSTRY AND ENERGETICS

2. Code:**3. Cycle of study:**

1

4. ECTS credits:

5

5. Type of course: Mandatory Elective**6. Prerequisites:****7. Class restrictions:****8. Duration / semester:**

1

4

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:

Environmental protection engineering, Occupational safety

12. Lecturer:

Franc Andrejaš, associate professor

13. Lecturer's e-mail:

franc.andrejas@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

To outline the fundamental settings of the waste management system in general, as well as the specifics of the waste management system of industry and energy, through the analysis of different technologies and the general waste cadastre.

16. Learning outcomes:

After the full accomplishment of the course, as envisaged in the course syllabus, students are expected to be able to:

- be able to identify the sources and the nature of the generated waste matter
- can assess the impact of waste materials on the environment
- discuss with arguments about the possibilities of reducing their quantity, and be able to actively participate in the creation and analysis of programs for these operations

17. Course content:

Introduction.
 Definitions of the term "waste". Terminology used.
 Responsibilities and obligations: principle of "polluter pays". Waste management hierarchy.
 Life cycle analysis principles. The price of environmental management: Eco-eco concept.
 General classification of waste. Classification of waste by source, as well as the possibility of its reuse or recycling.
 Reduction at source: minimization of waste. Cleaner production.
 Basics of environmental legislation: EMAS, IPPC, ISO 14000 series, BiH legislation. BAT concept.
 Recapitulation. TEST
 Municipal waste: definition, composition, disposal. Landfill waste.
 Waste volume reduction techniques. Crushing, concentrating, burning.
 Waste biomass: concept and definition. Treatment and application.
 The chemical industry on the basis of the brine processing.
 Coal-based chemical industry. The oil-based chemical industry.
 Metallurgy. Food industry.
 Waste streams of energy objects.
 Recapitulation. TEST

18. Learning methods:

Lectures, laboratory exercises, field teaching, group and individual consultations. Lectures will be multimedia supported when appropriate, with the expected active participation of students in the discussion. The exercises will be conducted in interactive form, through the practical execution of laboratory experiments. Visits to relevant economic and other organizations will demonstrate the link between theory and practice. Consultations will facilitate and deepen understanding of the subject matter.

19. Assessment methods:

Throughout the course, students are required to attend lectures and exercises on a regular basis, which will be monitored by the subject teacher and associates and, on special forms, keep records. During the semester, the student can be absent from a maximum of three lectures and three exercises, being obliged to bring proof of justification of absence (medical certificate, etc.). In the case of more unexcused absences, the student loses the right to the signature of the teacher.

- TESTS - Two tests throughout the semester. Each test consists of a maximum of 20 short theoretical questions related to the previously processed material and carries 20 points (for a passing grade, one should achieve a minimum of 11 points). Tests are usually conducted after every six weeks of instruction, whereby the subject teacher will announce them to the students at least two weeks before each test.

LABORATORY EXERCISES: the student is obliged to do all laboratory exercises, and based on activity in exercises can achieve a maximum of 25 points (for a passing grade should achieve a minimum of 13 points).

- FINAL PART OF THE EXAM - Students who have collected the minimum required number of points for the pass grade (54 points) by all criteria, have the right on deserved grade or to use the option of additional (verbally or in writing exam) for a higher final grade. The maximum number of points that can be obtained on the final exam is 30. The minimum number of points, which must be reached on the final exam is 18.

All the students who did not meet the conditions in one of the tests or who are not satisfied with the grade, but who have completed all other obligations of the course (have the signature of the subject teacher in the index) take the final exam. The student can not get a final grade if he has not passed both tests.

20. Assessment components:

The final grade is based on the total number of points obtained through pre-requisites and the final exam, according to the quality of the acquired knowledge and skills. It has a maximum of 100 points, according to the following scale:

Regularity of teaching attendance (lectures + exercises): 5 points

Activity in laboratory exercises: 25 points

Tests (theory): 40 points

Final Exam: 30 points

21. Required reading list:

1. Cheremisinoff N.P. (2006) Handbook of Solid Waste Management and Waste Minimization Technologies, Butterworth-Heinemann.

2. Đuković J., Burić D. (1990) Zaštita životne okoline: zaštita vazduha, Svjetlost, Sarajevo.

22. Web sources:

<http://www.emas.org.uk/>

http://ec.europa.eu/environment/emas/documents/legislative_en.htm

<http://www.iso14000-iso14001-environmental-management.com/>

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: