

SYLLABUS

1. Course title:

Sampling methods of polluting substances in air, water and soil

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

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:

Environmental protection engineering

12. Lecturer:

Abdel Dozić, assistant profesor

13. Lecturer's e-mail:

abdel.dozic@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

Provision of sampling procedures for contaminated air, water and soil
Monitoring the environment and determining pollutants in the laboratory and in the field using standard procedures, procedures and equipment

16. Learning outcomes:

Identifies and benefits Legislation Regarding Limit Values of Pollutants in Environmental Components.
It uses field and laboratory sampling and analysis equipment
Stand alone work in laboratories dealing with quality control of water, air and land.
It analyzes and addresses specific environmental monitoring issues.

17. Course content:

Quality assurance of environmental constituents (water, air and land). Standard methods for sampling and analysis of environmental parameters. Sampling, preserving and preparing samples of water, air and soil. Determination of basic water quality parameters in the field. Determination of inorganic pollutants AAS (flame + graphite technique) and UV-VIS spectrophotometer. Determination of organic pollutants by gas and liquid chromatography. Sampling of pollutants in the gas phase from stationary sources of pollution (heavy metal sampling, gas HCl and HF, VOC, H₂S, SO₂, NO_x, CO, CO₂ and solid particles). Determination of gaseous pollutants concentration by portable metering equipment. Mobile stations for measuring air quality, choice of metering points. Determination of PM₁₀, PM_{2.5} particles and precipitate. Extraction of organic pollutants from soil. Solid Explosion Techniques for Trace Elements Analysis. Analysis of inorganic and organic pollutants. Measurement of soil radioactivity.

18. Learning methods:

The following activities of successful learning are planned: concrete experience and reflection. Learning styles are preferred: visual style, auditory, logical-mathematical and stand-alone. The most important learning methods in the subject are:

- Lectures with the use of multimedia resources, active learning techniques and with active participation and student discussion;
- Experimental exercises

19. Assessment methods:

Throughout the course, students are required to regularly attend lectures and exercises. Students' attendance records will be regularly kept. On a special form, the subject teacher will continuously monitor the presence of each student. During the semester, the student can maximally abstain from three lectures and three exercises, where he is obliged to provide evidence of justification of non-attendance (medical certificate, and the like). In case of multiple unjustified absences, the student loses the right to sign the subject teacher.

- TESTS - Two tests during the semester for the oral exam. Each oral exam test consists of 20 short theoretical questions related to the material being studied and carries 15 points (min passage 8 points). The tests are performed approximately every six weeks of instruction, and the subject teacher will announce them to the students at least two weeks before each test.
- LABORATORY EXERCISES: the student is obliged to undertake all laboratory exercises and can exercise a maximum of 25 points (minimum of 12 points) based on exercise activities.
- FINAL PART OF THE EXAM - Students who have compiled the required number of points according to all criteria (54 points) have the possibility to additionally (verbally or in writing) correspond to a higher closing score. The maximum number of points that can be reached on the final exam is 30. The minimum number of points to be compulsory on the final exam is 18.

All the students who did not meet one of the tests or who are not satisfied with the grade and who have completed all the obligations on the subject (have the signature of the subject teacher in the index) approach all exams. A student can not enter a grade if no tests have been passed.

- SEMINAR WORK OF STUDENTS: students have the opportunity to do one seminar work. Successfully prepared and defended seminar work is evaluated with a maximum of 10 points (minimum 6 points), which are added to the total number of points achieved on other bases in the formation of the final grade.

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:

Classroom attendance (P + V): 5 points

Activity in laboratory exercises: 25 points

Tests (theory): 30 points

Seminar work: 10 points

Final Exam: 30 points

21. Required reading list:

Dean, J.R. (2003). Methods for Environmental Trace Analysis. John Wiley & Sons, Chichester

Reeve, R.N. (2002). Introduction to Environmental Analysis, John Wiley & Sons, Chichester

22. Web sources:

http://www.pitzer.edu/academics/field_groups/environmental_analysis

<http://www.pomona.edu/academics/departments/environmental-analysis>

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session: