

SYLLABUS

1. Course title:

SOIL POLLUTION AND PROTECTION

2. Code:**3. Cycle of study:****4. ECTS credits:****5. Type of course:** Mandatory Elective**6. Prerequisites:**

No prerequisites

7. Class restrictions:

No class restrictions

8. Duration / semester:**9. Weekly contact hours:**

9.1. Lectures:

3

9.2. Seminars:

0

9.3. Laboratory/Practice classes:

2

10. Faculty:

Faculty of Technology

11. Department/study program:

Agronomy

12. Lecturer:

Abdel Dozić, Ph.D. assistant professor

13. Lecturer's e-mail:

abdel.dozic@untz.ba

14. Web site:

www.tf.untz.ba

15. Course aims:

Development of active knowledge of the importance and role of soil in the process of food production as well as possible causes of soil contamination / pollution .
 Understanding the interaction of polluting substances, soil, plant culture.
 Understanding the engineering approach in the analysis and application of soil protection methods.
 Mastering the techniques of remediation of soil contaminated / polluted with heavy metals and organic pollutants.

16. Learning outcomes:

After the successful completion of the course, the student is expected to:

- Identifies and uses the legal regulation, relating to the limit values of pollutants in different types of soil
- Identifies sources of soil contamination
- Identifies polluting substances with the greatest negative impact on soil and their adoption by plant cultures
- Establish a criterion for selecting a soil remediation process,
- Established soil remediation technology depending on the type of contamination

17. Course content:

Basic soil characteristics, Physical and chemical characteristics of soil.
 Biological characteristics and soil fertility.
 Production and ecological role of soil
 Biological - regulatory and spatial role of soil
 Soil as a medium of storage (accumulation) of matter
 Soil damage and contamination
 Classification of soil damage
 Most common pollutants in the soil and sources of contamination
 Pollution from the processes of production of energy, coke, calcined soda, salt, sintering of iron ore and disposal of industrial and municipal waste
 Biological soil remediation (bioremediation, bioventilation, phytoremediation, phytoextraction / phytoaccumulation, phytostabilization and phytovolatilization)
 Chemical remediation of the soil (electrochemical remediation, soil dilution, soil washing, soil solidification and natural purification)
 Physical soil remediation (coverage / soil capsulation, soil damping and mixing)
 Thermal soil remediation (soil incineration, vitrification and solar photochemical degradation of the soil)

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 discussion of students;
- Experimental exercises

19. Assessment methods:

Throughout the course, students are required to attend lectures and exercises on a regular basis. Records of student attendance will be regularly conducted. On the special form, the subject teacher will continuously monitor the presence of each student. 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 15 points (for a passing grade, one should achieve a minimum of 8 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 12 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 all tests.

- SEMINAR WORK OF STUDENTS: students have the opportunity to do one seminar work. Successfully prepared and orally presented 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:

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

Activity in laboratory exercises: 25 points

Tests (theory): 30 points

Seminar work: 10 points

Final exam: 30 points

21. Required reading list:

Kisić, I. (2011). Sanacija onečišćenog tla. Agronomski fakultet sveučilišta u Zagrebu

Bašić, F. (2009). Oštećenje i zaštita tla. Agronomski fakultete sveučilišta u Zagrebu

Sofilić, T. (2014). Onečišćenje i zaštita tla. Metalurški fakultet. Sisak

22. Web sources:

<http://www.on.ec.gc.ca/pollution/ecnpd/tabs/tab22-e.html>

<http://www.ersremediation.com/remediation/thermal>

<http://www.astecinc.com/images/tile>

23. Applicable starting from the academic year:

2016/2017

24. Adopted in the Faculty/Academy session: