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| **Óbuda UNIVERSITY** |
| Rejtő Sándor Faculty of Light Industry and Environmental Engineering | Faculty | Institute of Environmental Engineering | Institute |
| Title of the course (inc. Neptun code): | Soil Protection (RKXKE3ABNE) | Credit | 4 |
| Type (compulsory/optional): | Compulsory | Education Type: | Full time | Semester: | 4 |
| Environmental Engineering | Environmental Engineering |
| Course leader: | Dr. habil. Ágnes Bálint-Mészáros | *Lecturer:* | Dr. habil. Ágnes Bálint-Mészáros |
| Required preliminary knowledge (incl. Neptun code): | Chemistry II. ( RMXCA1KBNE) |
| Weekly teaching hours:  | Lecture  | 2 | Classroom work:  | 0 | Laboratory work: | 2 |
| Exam type (ce; e; tm): | e | Language of course: | English | Course placement in class schedule: | Tuesday- Lecture: 13:30-17:00 (D.2.206) / every first weekTuesday- laboratory practice: 13:30-17:00 (D. 4.405.)/ every second week |
| **Curriculum** |
| **Course description** |
| This course aims to present the basic knowledge of the soil-soil concept, features, soil-forming materials, physical properties of soil, soil nutrient supply, and soil classification. It summarises the analysis of soil degradation processes and the impacts of human activities on soil quality within the soil conservation process. It provides comprehensive knowledge about soil organic and inorganic pollutants, their effects and the factors determining the spread of contamination. It presents the various remediation technologies and opportunities for remediation of contaminated sites and international experience. A particular lecture is devoted to on-site (in-situ, ex-situ) and off-site procedures. Furthermore, a special lecture deals with the various polluting substances and their detection and termination. |
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| Week of the semester in 2024 | Topics  |
| 1. | Definition of the soil and use of the soil 1. |
| 2. |  |
| 3. | Definition of the soil and use of the soil 2. |
| 4. |  |
| 5. | Soil formations and types of Colloids. Physical degradation of soils |
| 6. |  |
| 7. | Silicates, soil minerals.  |
| 8. |  |
| 9. | Methods of Soil Protection. Inorganic origins of various types of soil contamination.1. |
| 10. |  |
| 11. | Organic origins of various types of soil contamination. 2. |
| 12. |  |
| 13. | Phytoremediation of the soils. |
| 14. |  |
| Laboratory/week | Laboratory exercises |
| 1. |  |
| 2. | Brief description of laboratory safety. Soil section, soil levels, and the role of colour in determining soil types. |
| 3. |  |
| 4. | Manual examination of soil texture. Soil condition, compaction, secondary formations. Soil sampling: methods, rules. Determination of soil particle size distribution by sieve. |
| 5. |  |
| 6. | Determination of soil pH by different methods. Importance of soil sampling C/N ratio and determination by various methods. |
| 7. |  |
| 8. | Rector’s holiday. |
| 9. |  |
| 10. | Preparation of the collected soil the sample for measurement: soil solutions are flushed using different shaking techniques (ultrasonic and shaker), and other solutions (1 M KCl; 0.01 M CaCl2 and 1% KCl solutions)Determine the amount of nitrate nitrogen exchangeable from the soil solutions. |
| 11. |  |
| 12. | Determine the amount of exchangeable ammonium nitrogen from soil solutions. |
| 13. |  |
| 14. | Determine the amount of exchangeable phosphate ions from soil solutions. Test in an e-learning system. The date can be changed. |
| **Compulsory** |
| Attendance: is obligatory (you can stay up to 30% of lectures away) |
| Compulsory |
| Test papers, measurement records, reports, etc. (number, date) |
| For the semester sign: Everybody must give a presentation about the soil and protection of their own country (10 points). Give laboratory reports (30 points). (10+30=40 points; the minimum performance is 21 points).  |
| **Written test in e-learning system (60 points). The successful test is from 31 points.** |
| Methods of qualification: |
| Marks of the end of the semester:>50: 1; 51-60: 2; 61-75: 3; 76-85: 4; 86-100: 5In case of mid-semester mark fail (1), correction opportunities are available according to the Student Requirements Regulation (HKR). |
| **References** |
| **E-book: RPC Morgan: Soil Erosion and Conservation, National Soil Resources Institute, Cranfield University, Blackwell Publishing, 2005, (sufficient chapters will be in e-learning), Soil Science, Course Material, ARC, -LNR, in the system e-learning****lecture presentations: in the system, e-learning** |
| **Humberto Blanco, Rattan Lal: Principles of Soil Conservation and Management, Springer Verlag, 2008 (in the e-learning system)** |
| Methods of quality assurance: |
| Course lecturers are reviewed yearly, where the effectiveness of knowledge transfer, as well as results of student and graduate surveys, are taken into consideration. Based on these assessments, course development actions can be initiated in the following areas: - method of knowledge transfer, - the content of the curriculum, - the relationship between lectures and practical work. Changes and results of changes are assessed yearly and documented in a written report, and the elements accepted are incorporated into the course program according to the timing set by the course leader. |
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Date: 02.02.2024. Budapest

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Compiled by: Dr. Ágnes Bálint-Mészáros

 Associate Professor