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| **Óbuda UNIVERSITY** |
| Rejtő Sándor Faculty of Light Industry and Environmental Engineering | Faculty | Institute of Environmental Engineering and Natural Sciences | 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 Mészáros-Bálint | *Lecturer:* | Dr. habil. Ágnes Mészáros- Bálint |
| 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): | tm | Language of course: | English | Course placement in class schedule: | Monday- Lecture: 11:40-13:20hWendesday laboratory practice: 14:25-17:50h (every second week) |
| **Curriculum** |
| **Course description** |
| The aims of this course to present the basic knowledge of the soil - soil concept, features, soil forming materials, physical properties of soil, soil nutrient supply, soil classification. It summarizes 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.**We start the semester online until the pandemic is resolved. Lectures and exercises are mandatory in Teams. As soon as the pandemic situation is resolved and you can re-enter the faculty building, we continue the laboratory in the traditional way (room 405). There will be 10 test questions for each new ppt or curriculum selected from the compulsory textbook. Acceptable test rate min. 6 correct answers. I allow those who fail to meet the minimum condition for the first time to repeat the solution of the tests several times. A consultation will also be possible at a separately agreed time in the appropriate group of Teams.** |
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| Week of semester | Date (2021) | Topics  |
|  | 08.02. | Definition and properties of the soil. |
|  | 15.02. | Soil phases, and their role. Silicates, soil minerals I. |
|  | 22.02. | Silicates, soil minerals II. Soil formations. |
|  | 01.03. | Properties of Colloids. |
|  | 08.03. | Colloids and their role in soils.  |
|  | 15.03. | National Holiday |
|  | 22.03. | Soil conservation. |
|  | 29.03. | Physical degradation of soils. |
|  | 05.04. | Eastern |
| 10. | 12.04. | Methods of soil protection. |
| 11. | 19.04. | Inorganic origins of various types of the soil contamination.  |
| 12. | 26.04. | Organic origins of various types of the soil contamination. |
| 13. | 03.05. | Phytoremediation of the soils.  |
| 14. | 10.05. | Test in e-learning system. |
| Compulsory |
| Attendance: is obligatory. You can miss 3 lectures or 1 practice. If absences exceed this rate, the semester is invalid. |
| Compulsory |
| Test papers, measurement records, reports, etc. (number, date) |
| 1. During the semester:1.1. We expect the preparation of a report on laboratory and field measurements and laboratory visits. Tasks must be uploaded to Moodle by the specified deadline. I score each task in %, of which I determine an average %. Everyone gets the corresponding % of the maximum score available. (30 points available maximum)1.2. During the year, in the Teams system, the soils of one's own country and its protection must be described in a summary lecture (compulsory). (10 points available maximum) Minimum score: 21 pointsFor the semester sign: Everybody has to give a presentation about the soil and protection about own country (10 points). Give laboratory reports (30 points). (10+30=40 points; the minimum performance is 21 points). 2. At the end of the semester: In the last lecture of the semester a final test is written in the Moodle system. You can get 60 points for this. Minimum score: 31 points. |
| **Written test in e-learning system (60 points). The successful test is from 31 points.** |
| Methods of qualification: |
| Marks of the end of semester:>52: 1; 52-60: 2; 61-75: 3; 76-85: 4; 86-100: 5In case of mid-semester mark fail (1), correction opportunities are available according to 17§(6) of Education and Examination Regulations (TVSZ). |
| **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 effectiveness of knowledge transfer as well as results of student and graduate survey are taken into consideration. Based on these assessments course development actions can be initiated in the following areas: - method of knowledge transfer, - content of curriculum, - relationship of lectures and practical work. Changes and result of changes are assessed yearly, documented in written report and the elements accepted are incorporated into the course program according to the timing set by the course leader. |
| Laboratory practice |
| Weak of the semester | Topics of laboratory practice |
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|  | Safety of laboratory rules. Examination of soil binding. Definition of soil colour. |
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|  | Soil sampling. Texture of soil. C/N ratio in soil with different methods. |
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|  | Visit into Institute of Soil Sciences. (The date may vary depending on the pandemic). Should the visit fail due to the pandemic, phenol concentration in soil will be measured by HPLC. |
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|  | Determination of exchangeable nitrate content in soil solutions by different shaking techniques (ultrasound and shaker) and different shaking agents (1M KCl; 0.01M CaCl2 and 1% KCl solutions) |
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|  | Determination of exchangeable ammonium-N content in soil solutions by different shaking techniques (ultrasound and shaker) and different shaking agents (1M KCl; 0.01M CaCl2 and 1% KCl solutions) |
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|  | Determination of exchangeable phosphate content in soil solutions by different shaking techniques (ultrasound and shaker) and different shaking agents (1M KCl; 0.01M CaCl2 and 1% KCl solutions) |
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|  | pH measurement in soil with different methods. |

Date: 07.02.2021. Budapest

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Compiled by: Dr. Ágnes Mészáros-Bálint

 Associate Professor