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| 1. Course title: Analytical Chemistry II. lab. | | | | | |
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| 2. Code: | | 3. Type (lecture, practice etc.): practice | | | |
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| 4. Contact hours: 4 hoursper week | | 5. Number of credits (ECTS): 5 | | | |
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| 6. Preliminary conditions (max. 3):   * Analytical Chem. II. lect. | | | | | |
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| 7. Announced:fall semester, spring semester, both | | | | | |
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| 8. Limit for participants: 12 | | | | | |
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| 10. Responsible teacher (faculty, institute and department):  Ibolya Kiss PhD (Faculty of Science, Institute of Chemistry, Department of Analytical and Environmental Chemistry) | | | | | |
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| 11. Teacher(s) and percentage: | | Dr. Ibolya Kiss | | 20% | |
| Dr. Borbála Boros | | 10% | |
| Dr. Balázs Csóka | | 60% | |
| Dr. Tímea Pernyeszi | | 10% | |
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| 12. Language:English | | | | | |
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| 13. Course objectives and/or learning outcomes:  Objectives: Applying theoretical knowledge of instrumental analysis in practice.  Focusing student's attention to the problems that can be solved by analytical methods every day.  Learning outcomes: students completing the course will have *knowledge* on basic quantitative analytical methods. They will be *able* to measure and evaluate data. | | | | | |
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| 14. Course outline  Week 1: Introductory Practice  Week 2: Potentiometry I: Cerimetry: Cerimetric titration with redox potential  Week 3: Potentiometry II: Determination of pH of the solutions by direct potentiometric measurements  Week 4: Potentiometry III : Acid-alkalimetry: Titration of unknown concentrations of potassium hydroxide solution with potentiometric endpoint determination  Week 5: Conductometry I : Determination of concentration of potassium hydroxide solution by conductometric endpoint detection. Determining the hardness of drinking water  Week 6: Conductometry II: Determination of sulfate ion concentration by conductometric endpoint detection  Week 7: Spectrophotometry I .: Determination of the concentration of KMnO4 solution  Determination of the concentration of azorubine in a standard addition  Week 8: Spectrophotometry II.: Spectrophotometric analysis of the iron (III) sulfosuccinic acid complex  Week 9: Fluorescence: Determination of quinone content by fluorescence spectroscopy  Week 10: Atomic Spectroscopy (AAS): Determination of K+ ion concentration by atomic emission  Determination of the concentration of Cu (II) ion containing solution by atomic absorption (standard addition).  Week 11: Liquid Chromatography (HPLC): Investigation of Retention of Bioactive Compounds in Reverse Phase Liquid Chromatography  Week 12: Gas Chromatography (GC): Gas chromatographic determination of hydrocarbons  Week 13: Electrophoresis (CE): Determination of preservatives by capillary zone electrophoresis | | | | | |
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| 15. Mid-semester works  It is compulsory to participate in practice. | | | | | |
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| 16. Course requirements and grading  *Short written test:* Each week the laboratory session begins with a short test. The test is based on the exercises of that week and the previous week (calculations, theoretical background of the determinations).  *Lab note:* During the laboratory session, all students have to write a lab note, which should contain the theoretical background of the determinations, the procedure, all data of the measurements, calculations and conclusions.  *Final grade:* Grading is based on three separate factors:  - the average grade of short tests (an average of at least 2.0 is necessary to avoid a ‘fail’ final grade)  - the average grade of measurements, lab notes (an average of at least 2.0 is necessary to avoid a ‘fail’ final grade)  - the average grade Tests (an average of at least 2.0 is necessary to avoid a ‘fail’ final grade)  If one of the criterion is not fulfil, the final grade will be the fail and the student have to retake the course the next year. | | | | | |
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| 17. List of readings   1. Skoog, West, Holler, Crouch: Fundamentals of Analytical Chemistry, 9th edition Brooks/ Cole 2. Holler, Skoog, Crouch: Principles of Instrumental Analysis, 6th edition, Brooks/ Cole | | | | | |
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| 18. Recommended texts, further readings   1. An electronic textbook is available from the lecturer. 2. Harris, Daniel C. :Quantitative chemical analysis, 8th edition, New York: W. H. Freeman and Co., [2010], cop. 2010 | | | | | |
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| **Date** | 27 April, 2017 | **Prepared by** |  | | |
| Dr. Ibolya Kiss  responsible teacher | | |
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| **Endorsed by** | | |  | | |
| Dr. László Kollár program supervisor | | |