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| **Title and Code** of the subject: **Modern bioanalytical methods****MTBE7018A** | **ECTS Credit Points: 3** |
| **Type** of the subject: compulsory |
| **Ratio of theory and practice:**(credit%) 50 % theoretical, 50 % practical |
| **Type and number of classes per semester**: .. hour(s) lecture and .. hour(s) practice per **semester** Number of teaching hours / week : 1+2 (lecture and practice |
| **Type of exam**: practical course mark |
| **Subject in the curriculum:** 4th semester |
| Preliminary requirements:-MTBE7009A - Analytical chemistry  |

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| **Summary of content - theory**:  |
| Course objectives: description of instruments and methods used in modern bioanalysis.1. Techniques for Identifying Low-Food Compounds(UV-VIS, IR)
2. Determining Vitamins
3. Antioxidants and their Determination
4. Separation Technique (GC, HPLC)
5. Determine the sugars
6. Determination of fats and fatty acids
7. Mass Spectrometry (FAB / FIB, MALDI, API, MS)
8. Connected Analysis Methods (LC-MS, GC-MS, MS-MS)
9. Micro Extraction Techniques (SPME, LPME)
10. Definition of Proteins
11. Determination of Organic Micro-Contaminants
12. DNA, RNA
13. DNA, RNA
14. DNA, RNA
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| **Summary of content - practice**: |
| Skills to be learnt: the use of instruments and methods used in modern bioanalysis in practice 1. Introduction of UV-VIS
2. Measurement with FRAP method
3. Measurement with DPPH method
4. Introduction of HPLC
5. Measurement of standards with HPLC
6. Measurement of sapmes with HPLC
7. Introduction of Mass Spectrometer
8. First practice test
9. Introduction of Micro Extraction Techniques (SPME, LPME)
10. Introduction of Proteins measurement methods
11. DNA, RNA
12. DNA, RNA
13. Second practice test
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| **Literature, handbooks in English**  |
| Dr. Istvan Bak: Modern analytical techniques in the pharmaceutical- and bioanalysis (2011) |

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| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge**

Students learn about the base of different methods, techniques and instruments.1. **Ability**

Theoretical aspects of different methods, techniques and instruments, and these use.1. **Attitude:**

Student has a strong professional identity and professionalism that she/he can take for professional and wider social community.1. **Autonomy and responsibility:**

Student sees the importance of modern bioanalytical methods knowledge so that it can formally incorporate into their further university studies and at the end of their studies. Students will be able to autonomously and responsibly use the knowledge acquired in the course of their work in a deliberate manner. |
| **Responsible lecturer: Gálné Dr. Remenyik Judit, senior research** |
| **Other lecturer:-** |
| **Terms of course completion:** |
| 1. Completing assignments / exercises
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| **Form of examination:** |
| **written** (only if the subject is signed) |
| **Requirement(s) to get signature:** |
| Participation at practice is compulsory. Students must attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, being discussed with the tutor. |
| **Requirement(s) to get a grade:** |
| During the semester student has to write 2 theoratical and 1 practical tests. The minimum requirement for every mid-term and end-term tests is 50%. Based on the score of the tests separately, the grade for the tests is given according to the following table:Score (%) Grade0-49 fail (1) 50-65 pass (2)66-74 satisfactory (3)75-89 good (4)90-100 excellent (5)The student has to reach minimum 50% in every test. The sudent twice can take a retake test of the whole semester material. |