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| **Title and Code** of the subject:**Proteomics in food production, MTMEL7038A** | **ECTS Credit Points: 3** |
| **Type** of the subject: optional |
| **Ratio of theory and practice: 50%/50%** (credit%) |
| **Type and number of classes per semester**: 14 hours lecture and 14 hours practice per **semester** Number of teaching hours / week: 1+1 (lecture and practice) |
| **Type of exam**: exam  |
| **Subject in the curriculum:** semester 4 |
| Preliminary requirements:- |

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| **Summary of content - theory**:  |
| Successful completion of the course provides the knowledge, which is needed to understand the quality of food affected by the proteom. The theoretical knowledge of a number of methodologies and procedures taught during the course gives the opportunity to design proteomic examinations, search for biomarkers and evaluate them professionally. Absolved students are enriched by a complex vision of proteins that have a significant effect on raw and processed food.1. Proteomics Methods I.
2. Proteomics Methods II.
3. Proteomics of meat and meat products I.
4. Proteomics of meat and meat products II.
5. Proteomics of eggs
6. Proteomics of milk and dairy products
7. Proteomics of beer
8. Proteomics of wine
9. Cereals and proteomics
10. Fruits and their expressed proteins
11. Vegetable proteins from the food industry
12. Proteomics of fish as food
13. Mass spectrometry in food analysis
14. Chromatography, immunology, amino acid analysis in food analysis
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| **Summary of content - practice**: |
| Skills to be learnt: The general aim of the practise is to provide students the basics of gel-based proteomic methods, to perform laboratory analyses and evaluat the results of food samples. The acquired knowledge gives an insight into the critical points of the protein expression platform. 1. General laboratory knowledge, solution preparation
2. Protein isolation from meat
3. Protein isolation from meat
4. Protein concentration determination
5. Further purification of isolated protein
6. Depletion of highly abundant proteins
7. Fractionation of Proteins
8. Fractionation of Proteins
9. Isoelectric focusing
10. Isoelectric focusing
11. Polyacrylamide Gel Electrophoresis (2D)
12. Polyacrylamide Gel Electrophoresis (2D)
13. Polyacrylamide Gel Electrophoresis (1D)
14. Polyacrylamide Gel Electrophoresis (1D)
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| **Literature, handbooks in English**  |
| Posch A. ed (2008): 2D PAGE: Sample Preparation and Fractionation. Volume 1. Humana Press. 1-459.Cutillas P.R.,Timms J.F. (2010): LC-MS/MS in Proteomics. Volume 658. Humana press. 1-330.Fidel T.,Nollet L. M. L. (eds) (2013): Proteomics in foods. Springer. 1-710. |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* Knows the details of tools and methods used to control food and production processes.
1. **Skills:**
* Knows the details of tools and methods used to control food and production processes.
1. **Attitude:**
* Open, motivated and responsive to the knowledge and practical application of modern and innovative procedures, open to paradigm changes in food science and technology.
* Recognizes the values in the area of food safety and quality, and is responsive to the use of effective methods and tools.
1. **Autonomy and responsibility:**
* Feels responsibility for the quality and safety of food produced being part of it.
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| **Responsible lecturer: Dr. Levente Czeglédi, Associate Professor** |
| **Other lecturer(s):**  |

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| **Terms of course completion:** |
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| **Form of examination:** |
| written |
| **Requirement(s) to get signature:** |
| Participation in lectures according to Rules and Regulations of UD, laboratory report |

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| **Exam questions:** |
| 1. Gel based proteomic methods
2. Meat proteomics
3. Proteomics of meat products
4. Proteomics of eggs
5. Proteomics of milk and dairy products
6. Proteomics of beer
7. Proteomics of wine
8. Cereals and proteomics
9. Fruits and their expressed proteins
10. Vegetable proteins from the food industry
11. Proteomics of fish as food
12. Mass spectrometry in food analysis
13. Chromatography, immunology, amino acid analysis in food examinations
14. The importance of depletion and fractionation in laboratory examinations
15. Implementing 1D PAGE and 2D PAGE, critical points
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