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| **Title** of the subject: **Food colloidics MTBE7012** | **ECTS Credit Points: 3** |
| **Type** of the subject: **compulsory** / optional |
| **Ratio of theory and practice: 100/0** (credit%) |
| **Type and number of classes per semester**: 28 hour(s) lecture per **semester** Number of teaching hours / week : 2 + 0 (lecture and practice) |
| **Type of exam**: **exam** / practical course mark |
| **Subject in the curriculum:** **semester 3.** |
| Preliminary requirements:- |

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| **Summary of content - theory**:  |
| Course objectives: The history of colloid science. Classification and introduction of colloidal systems. Classification and functions of colloidal systems in Food. Types of colloidal system in Food.**Schedule:**1. The history of colloid science. Colloid systems. Associated colloids, macromolecular colloids.
2. Category of colloid systems.
3. Suspensions, true solutions and colloidal solutions. Optical properties of colloidal systems.
4. Colloidal suspensions I.
5. Colloidal suspensions II.
6. Spray, mist, aerosols.
7. Emulsions.
8. Emulsifiers and stabilizers.
9. Application of emulsions in food industry.
10. Foam and solid foam. Application of foam in the food industry.
11. Hydrocolloids in food industry, the health aspects of hydrocolloids.
12. Hydrocolloids in food industry (agar, starch, gelatin).
13. Hydrocolloids in food industry (carrageenan, furcellaria, xanthan gum).
14. Hydrocolloids in food industry (galactomannans, gum arabic, pectins, milk and egg protein).
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| **Summary of content - practice**: |
| Skills to be learnt: Application of different colloid systems in food industries and food stuffs. Calculation method in food colloid science. **Schedule:**1. Colloids. Colloid systems
2. Category of colloid systems
3. Suspensions, true solutions and colloidal solutions
4. Colloidal suspensions
5. Colloidal suspensions - Calculations
6. Aerosols
7. Emulsions
8. Emulsifiers and stabilizers
9. Application of emulsions in food industry. HLB calculations I.
10. Application of emulsions in food industry. HLB calculations II.
11. Application of emulsions in food industry. HLB calculations III.
12. Foam and solid foam. Application of foam in the food industry
13. Hydrocolloids in food industry I.
14. Hydrocolloids in food industry II.
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| **Literature, handbooks in English**  |
| 1. Cosgrove T.: 2005. Colloid Science, Principles, Methods and Applications. Bristol, UK. Blackwell Publishing Ltd.
2. Belitz D., Grosch W., Schieberle P.: 2004. Food Chemistry, Springer Verlag.
3. Ludger O. Figura, Arthur A. Teixeira: 2007. Food Physics, Springer, Heidelberg.
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| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* Students have to know the basic principles of laboratory examination for the food technology and food safety analysis.
1. **Skills:**
* Students have to have the ability to learn laboratory techniques, taking into account the environmental and health protection standards, and apply new methods in the whole area of food production.
1. **Attitude:**
* Students have to be receptive to learn the needed theory, in order to understand how the equipment and tools, used in food industry, function.
1. **Autonomy and responsibility:**
* Students should be able to take responsibility for their own work and and for the work of their colleagues under their supervision, as well.
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| **Responsible lecturer: Béla Dr. Kovács; Éva Bacskainé Dr. Bódi** |
| **Other lecturer(s):**  |

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| **Terms of course completion:** |
| 1. Giving presentation (10 minutes)
2. Written exam (minimum 60%)
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| **Form of examination:** |
| Written exam |
| **Requirement(s) to get signature:** |
| Giving presentation (10 minutes) |

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| **Exam questions:** |
| 1. What kind of systems are colloid systems?
2. Introduce the colloidal systems by structure!
3. Introduce the various types of colloidal systems!
4. Associated colloids, macromolecular colloids. Lyophilic colloids, lyophobic colloids.
5. What is the difference between suspensions, true solutions and colloidal solutions?
6. Tyndall effect. Brownian movement.
7. Suspensions. List some example for food suspensions!
8. Aerosols. What is the meaning of deposition in aerosol physics?
9. List the main types of emulsion!
10. How can you decide the type of an emulsion?
11. Explain the cleaning action of soap!
12. . Explain how do emulsifiers work! What is surface tension?
13. What is HLB (Hydrophilic-Lipophilic Balance)?
14. Why can we say, that the HLB value can be used to predict the surfactant properties of a molecule?
15. What do you know about the foam structure?
16. Draw the structure of the foam and name their main parts!
17. List some factors that have effect on foam stability!
18. What are hydrocolloids?
19. What are the main sources of hydrocolloids?
20. What is the reasons that hydrocolloids are commonly used in the food industry?
21. Why can we say, that alginates are commonly used in the food industry?
22. Why can we say, that carrageenans are commonly used in the food industry?
23. What are the main factors that determine the solubility of carrageenans?
24. List some foods that contain agar!
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