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| **Title and Code** of the subject: **Technology of vegetable oil and animal fat industry, MTBE7033** | **ECTS Credit Points: 3** |
| **Type** of the subject: compulsory  |
| **Ratio of theory and practice:** (33/66 %) |
| **Type and number of classes per semester**: 14 hour(s) lecture and 28 hour(s) practice per **semester** Number of teaching hours / week: 1+2 (lecture and practice) |
| **Type of exam**: written exam  |
| **Subject in the curriculum:** semester 6 |
| Preliminary requirements:- |

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| **Summary of content - theory**:  |
| Course objectives: to provide practical up-to-date information on oil and fat processing including chemical structure, conventional and special raw materials, typical sources for the industry, processing techniques and technologies and economics and market aspects, tendencies. The course provides information to improve the knowledge and the practical skills of the students. **Schedule:**1. Raw materials of oil industry (plants, cereals, vegetables, fruits), properties of the oil (Chemical parameters)
2. Technology of oil production, oil refining
3. Oil groups, by-products of oil production
4. Quality and (physical and chemical) properties of oil
5. oil plants – pressed from different parts of plant (seed, pulp, flower, sprout, root, steam, leaf
6. Essential oils, aroma oils, oily extracts, squalene, other oils
7. Animal oils, plants/cereals//vegetables/fruits fat
8. Structure and classification of fat lipids
9. Animal fat as raw material and food ingredient
10. Fat processing technology
11. Fat types and by-products
12. Quality and properties of fat and oil
13. Special oils and fats
14. The oil and fat market (2018)
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| **Literature, handbooks in English**  |
| 1. Diósi G., Stündl L. (2019): Practical exercises for the course of Oil and fat technology. – Textbook. University of Debrecen, Faculty of Agricultural and Food Sciences, and Environmental Management
2. Talati, A: Extraction Methods Of Natural Essential Oils. Method. February 2017. DOI: 10.13140/RG.2.2.18744.34564
3. Anon: Production of Lipids From Natural Sources. http://ocw.nagoya-u.jp/files/1/chap2.pdf
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| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* Knowledge of technical expressions of oil and fat processing.
* Knowledge of basic principle of oil and fat processing technologies.
* Knowledge of the methods of skill improvement and learning in the relevant field of study (oil and fat processing.
1. **Skills:**
* Capable of using oil and fat processing technologies
* Capable of improving his/her knowledge and to use various methods of obtaining knowledge and self-education
* Have good communication skills, he/she is able to express his/her professional point of view in a debate
* Capable of using the on-line and printed literature in the relevant field.
* Capable of problem solving individually or in a team.
1. **Attitude:**
* Open for the opinion of others in the relevant field (oil and fat processing)
* Open for the plans and questions of economic actors
* Determined to improve oil and fat processing technologies
1. **Autonomy and responsibility:**
* He/she has a sense of responsibility and bears the consequences of his/her activities
* Expresses his/her opinion individually with full responsibility based on his/her professional knowledge
* Takes responsibility for the work of others
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| **Responsible lecturer: Dr. László Stündl, associate professor and Dr. Gerda Diósi, assistant lecturer** |
| **Other lecturer(s):**  |
| **Terms of course completion:** |
| 1. exam
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| **Form of examination:** |
| written exam |
| **Requirement(s) to get signature:** |
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| **Exam questions:** |
| 1. What does oil vegetable/cereals/plant mean?
2. List at least 5 oil vegetable/cereals/plant and their composition!
3. How do we group fatty acids?
4. Characterize saturated fatty acids!
5. Characterize unsaturated fatty acids!
6. How is vegetable/cereals/plant oil production done? Draw the oil production process!
7. What is the problem with the erucic acid, what markings are known for erucic acid?
8. What does oil refining mean, how is oil refining done?
9. What are the requirements for solvents?
10. How can we characterize the quality of the vegetable/cereals/plant oils?
11. Which are the products of the oil industry? Describe them!
12. Which are the by-products of the oil industry? Describe them!
13. How are margarine products made?
14. How can we classify oils?
15. What does ester mean?
16. Draw the structural formula of the stearic acid!
17. Draw the structural formula of the oleic acid!
18. Draw the structural formula of the palmitic acid!
19. What are the trans fatty acids and cis fatty acids? Characterize them!
20. How do you qualify oils and fats?
21. What are the processes of rancidity?
22. What do you know about the minor and the rare fatty acids? Write 5 examples and characterize them!
23. What do you know about the special oils from the pulp? Write 5 examples and characterize them!
24. What do you know about the special oils from the seeds? Write 5 examples and characterize them!
25. What do you know about the special oils from the different plant parts (flower, root, stem, leaf, sprout etc.)? Write 5 examples and characterize them!
26. Characterize the essential oils! What are the roles of essential oils in the pharmaceutical industry, food industry, beauty industry/cosmetology?
27. How are essential oils made? Describe the extraction/production methods?
28. What does squalene mean? (properties and utilization)
29. What do you know other oils, special oils?
30. What do you know about the vegetables/cereals/plant fats? Characterize them!
31. What do you know about the animal oils? Characterize them!
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