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| **Title and Code** of the subject:  **Technologies of brewing and distilling industries MTBE7032A** | **ECTS Credit Points: 3** |
| **Type** of the subject: compulsory | |
| **Ratio of theory and practice: 33/66** (credit%) | |
| **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**: practical course mark | |
| **Subject in the curriculum:** semester 6 | |
| Preliminary requirements:- | |

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| **Summary of content - theory**: |
| Course objectives: The main aim of the lectures is to know the methodologies of different spirit drink productions and the requirements for raw materials. Students will know the requirements and laws and requirements relation to spirit drink and spirit drink production. Students will know the mistakes which may occur in the spirit drink production, thereby affecting the quality of spirit drinks.  **Schedule:**   1. Raw materials of spirit production 2. Legislation of spirit drink production 3. Malt production and malt drying 4. Mashing in brewing industry, enzymatic processes, wort production, fermentation and maturation 5. Production technologies of beer beverages 6. Raw materials of “pálinka” fruit spirit production, legislation of production 7. Production of fruit “pálinka”, operation of mashing and distillation 8. Technologies of production in red, white and rose wine production 9. Production of champagne 10. Production of liqueur 11. Production of whisky, vodka and brandy 12. Production of gin and cognac 13. Mistakes in spirit drink production 14. Test |
| **Summary of content - practice**: |
| Skills to be learnt: The main aim of the practices is to know the steps of beer production and the analytical tests. Additional aim to know the steps of “pálinka” and other spirit drink production and the determination of quality analysis of these drinks.  **Schedule:**   1. Grouping of different beer types 2. Brewing equipment and ingredient 3. Brewing I. (British Pale Ale) 4. Brewing II. (Pilsner) 5. Brewing III. (Porter) 6. Mash preparation (“pálinka” production) 7. Production of home-made beverages 8. Sampling and sample preparation of spirit drinks 9. Quality analysis of beers 10. Mineral analysis of spirit drinks 11. Quality analysis of wines and bitters 12. Calculation of different quality parameters of spirit drinks 13. Flow diagram 14. Manufacturing formula |
| **Literature, handbooks in English** |
| 1. Ted Goldammer (2008): The Brewer's Handbook. A Complete Book to Brewing Beer. Apex Publishers. (ISBN: 978-0-9675212-3-3) 2. Andrew G.H. Lea, John Piggott (2003): Fermented Beverage Production. Kluwer Academic/Plenum publishers. (ISBN: 0-306-47275-9) 3. Keith Grainger (2008): Wine production. Vine to bottle. John Wiley and Sons Inc. (ISBN: 9781405173544 |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**  * Students will know the principles, equipment, instrument of spirit drink industries and will know the operation of these in practice * Students will know the requirements of raw materials in spirit drink industries and laws and regulations for spirit drinks  1. **Skills:**  * Students will be able to participate in spirit drink production and product development * Students will be able to carry out quality analysis of spirit drinks  1. **Attitude:**  * Students will endeavour to apply the newest technologies  1. **Autonomy and responsibility:**  * Students shall be able to feel responsible for high-quality and safe spirit drink production |

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| **Responsible lecturer: Dr. Nikolett Czipa, associate professor** |
| **Other lecturer(s): Loránd Alexa, PhD student** |

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| **Terms of course completion:** |
| 1. Exercises |
| **Form of examination:** |
| Test |
| **Requirement(s) to get signature:** |
| Successful test (60%) and participation in practices |

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| **Exam questions:** |
| 1. Grouping of raw materials in spirit drink production 2. Characterisation of raw materials in beer production, requirements of raw materials 3. Grouping of different beer types 4. Steps of beer production 5. Process of mashing in beer production 6. Characterisation of determining parameters of beers 7. Determination of colour, acid content and foam stability 8. Requirements of usable fruits in “pálinka” production 9. Steps of “pálinka” production 10. Steps of red wine production 11. Steps of white wine production 12. Steps of whiskey production |