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| **Title** of the subject:  **Processing and preservation of horticultural products, MTBE7028A** | **ECTS Credit Points: 3** |
| **Type** of the subject: compulsory | |
| **Ratio of theory and practice: 50/50** (credit%) | |
| **Type and number of classes per semester**: 28 hour(s) lecture and the connected practice is in the Weekly practical assignment  Number of teaching hours / week : eg.:2+0 (lecture and practice) | |
| **Type of exam**: exam | |
| **Subject in the curriculum:** semester 5th | |
| Preliminary requirements:- | |

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| **Summary of content - theory**: |
| Course objectives: The course aims to introduce students the quality, rating, storage and processing of fruits and vegetables, the properties and requirements of main product groups and the factors influencing their quality.  **Schedule:**   1. Quality of fruits and vegetables; chemical and physical parameters. 2. Maturation, physiology of maturation, methods determining the maturity stage. 3. Storage, storing methods, processes during storage. 4. Deterioration processes of horticultural products. 5. General operations and preparation methods of fruit and vegetable processing. 6. Preservation by heat extraction, process of freezing, freezing methods, frozen products. 7. Preservation by water extraction, process of drying, drying methods, dried products. 8. Concentrated products, thermal and non-thermal processes. 9. Preservation by heat treatment, heat-treating methods, heat-treated products. 10. Fermentation processes: lactic acid fermentation, methods and products. 11. Fermentation processes: alcoholic and acetic acid fermentation, methods and products. 12. Wine production. 13. Preservation by irradiation and chemical preservation. 14. Combined preservation and novel methods in preservation. |
| **Summary of content - practice**:- |
| **Literature, handbooks in English** |
| 1. James G. Brennan (ed.) 2006. Food Processing Handbook. WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, ISBN: 3-527-30719-2. p. 582. 2. M. Shafiur Rahman (ed.). 2007. Handbook of food preservation, Taylor and Francis Press. p. 1068. 3. Zeki Berk (ed. Steve L. Taylor) 2009. Food Process Engineering and Technology. Elsevier. p. 605. 4. P. Fellows 2000. Food Processing Technology. Published by Woodhead Publishing Limited. Abington Hall, Abington, Cambridge CB1 6AH, England. (ISBN 1 85573 533 4) p. 575. 5. Y. H. Hui, S. Ghazala, D. M. Graham, K.D. Murrell,W Nip 2004: Handbook of Vegetable Preservation and Processing. Maecel Dekker Inc., 752. p. 6. Y. H. Hui, J. Barta, M. P. Cano, T.W. Gusek, J. S. Sidhu, N. K. Sinha 2006: Handbook of Fruits and Fruit Processing. Wiley-Blackwell, 712. p. 7. D. M. Barrett, L. Somogyi, H. S. Ramaswamy 2004: Processing Fruits: Science and Technology. CRC Press, 864. p. |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| * **Knowledge:** * Students know the fundamental conceptions, facts, theories, specialities and relations concerning food production and management. * Students know the food industrial principles, instruments, equipment and their operation in practice. * **Skills:** * Students are able to participate to develop and design technological systems, and to develop new operations and products. * Students are able to organize processes in food industry and to participate in elaboration of recommendations establishing decisions. * **Attitude:** * Students support professional questions constructively. They are sensitive to novelties. * Students make efforts to analyse and solve problems arising in the field of food industry. They can be characterized by being collaborating and adapting. * **Autonomy and responsibility:** * Students take the responsibility for their own work and their colleagues being under their leadership. |

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| **Responsible lecturer: Dr. Beáta Babka, assistant professor, PhD** |

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| **Terms of course completion:** |
| Completing written and oral exam |
| **Form of examination:** |
| Written and oral exam |
| **Requirement(s) to get signature:** |
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| **Exam questions:** |
| 1. Ingredients and composition of fruits and vegetables. Processes during maturation and ripening. 2. Parameters of quality and ripening. Determination of harvesting maturity; harvest. 3. Storing parameters, and their effects to the quality of the products. 4. Storing methods and their description. 5. Deterioration processes of horticultural products. Microbiological bases of preserving industry. Grouping of preservation methods. 6. Preparation methods (sorting, grading, cleaning). Their descriptions and roles in processing horticultural products. 7. Preparation methods (peeling, size reduction, blanching). Their descriptions and roles in processing horticultural products. 8. Theory of heat extraction preservation. Effects to the products and deterioration processes. Technological parameters and equipment types. 9. Producing technology of frozen fruit and vegetable products. 10. Theory of water extraction technology. Processes of drying horticultural products. 11. Drying operations and their equipment. Production of dried vegetables and fruits. 12. Theory of concentration preservation, their equipment and effects to the products. 13. Production of concentrated products. Concentration with membrane processes. 14. Theory of heat treatment, effects to the products and deterioration processes. Technological parameters and equipment types. 15. Production of heat treated fruit and vegetable products. 16. Lactic acid fermentation, pickles. 17. Fruit wine production. 18. Vinegar production. 19. Wine production. 20. Preservation by irradiation and chemical preservation. 21. Combined preservation and novel methods in preservation. |