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| **Title and Code** of the subject: **Food process control systems, MTBE7042A** | **ECTS Credit Points: 3** |
| **Type** of the subject: compulsory / optional |
| **Ratio of theory and practice: 30-70%** (credit%) |
| **Type and number of classes per semester**: 14hour(s) lecture and 14 hour(s) practice Number of teaching hours / week : eg.:1+1 (lecture and practice) |
| **Type of exam**: exam / practical course mark |
| **Subject in the curriculum:** semester: 5 |
| Preliminary requirements:Measurement techniques and automatization |
| **Summary of content - theory**: |
| The aim of the course is to make the knowledge of food engineering students about the control systems broader, to expand the basic automation knowledge in the field of the elements and operation of systems used in the food industry. During the semester, they get acquainted with the structure and programming of PLC systems and gain insight into the modern electronic and IT possibilities what can be used to manage, monitor and document production, learn the logic of these systems, which makes possible be used in practice and development.**Schedule:**1. Grouping and basic structure of process control systems2. Basics of PLC programming, application of binary logic in practical tasks3. Types, grouping and comparison of programming languages4. Basics of instruction line and ladder diagram programming5. Program plans for simple controls6. Sequential control, branches7. Food business control examples8. General characterization of microcontrollers, their grouping, application possibilities, their integration into other networks9. General structure of microcontroller systems, matching of sensors and actuators10. Programming microcontrollers I11. Programming microcontrollers II12. User interface integration, hardware and software connection13. Connection of control system to cloud based systems, data archiving, network integration14. Food and laboratory applications |
| **Literature, handbooks in English** |
| Ferenczi István 2018: PLC programozási alapismeretek. Nyíregyházi Egyetem, ISBN 978-615-5545-78-8Hegedűs József: Programozás létradiagramos programozási nyelven Nemzeti Szakképzési és Felnőttképzési IntézetHarsányi Réka - Juhász Márton András (2014): Fizikai számítástechnika: elektronikai alapok ésArduino programozás. Typotex Kiadó ISBN 978 963 279 189 0 |
| **Responsible lecturer:** Dr. Péter Sipos, associate professor, PhD |