|  |  |
| --- | --- |
| **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 systems 2. Basics of PLC programming, application of binary logic in practical tasks 3. Types, grouping and comparison of programming languages 4. Basics of instruction line and ladder diagram programming 5. Program plans for simple controls 6. Sequential control, branches 7. Food business control examples 8. General characterization of microcontrollers, their grouping, application possibilities, their integration into other networks 9. General structure of microcontroller systems, matching of sensors and actuators 10. Programming microcontrollers I 11. Programming microcontrollers II 12. User interface integration, hardware and software connection 13. Connection of control system to cloud based systems, data archiving, network integration 14. Food and laboratory applications | |
| **Literature, handbooks in English** | |
| Ferenczi István 2018: PLC programozási alapismeretek. Nyíregyházi Egyetem, ISBN 978-615-5545-78-8  Hegedűs József: Programozás létradiagramos programozási nyelven Nemzeti Szakképzési és Felnőttképzési Intézet  Harsányi Réka - Juhász Márton András (2014): Fizikai számítástechnika: elektronikai alapok és  Arduino programozás. Typotex Kiadó ISBN 978 963 279 189 0 | |
| **Responsible lecturer:** Dr. Péter Sipos, associate professor, PhD | |