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| **Programmable Logic Controllers** |

**Code: MFPRL31G04-EN**

**ECTS Credit Points: 4**

**Evaluation: mid-semester grade**

Year, Semester: 3rd, 1st

Number of teaching hours/week:

Lecture: **0**

Practice: **4**

**Prerequisites: Electrotechnics and Electronics I. MFELT31G03-EN,**

**Topics**:

Basic knowledge of main structures of programming PLC in theory and in practice, using TWIDO PLC. Introduction to the installation of programming software, learning the usage of the program. Basic knowledge of the internal structure of PLC. Basic knowledge of programming: usage of mathematical and logical structures. Programming in practice: Principles of using logical functions, timer structures, counter structures, analogue problems in theory and practice. Modelling of real industrial processes.

**Schedule**

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| **1st week:**  **Lecture:** Basic knowledge of PLC  **Practice:** | **2nd week:**  **Lecture:** Basic functions, and handling of the programming environment (Twido Suite)  **Practice:** Making of Test project. |
| **3th week:**  **Lecture:** Basic structures of PLC  **Practice:** Simple switches, pushbuttons, other types of contactors. | **4th week:**  **Lecture:** Basic structures of PLC  **Practice:** Using the structure of timers, TP TON, TOF. |
| **5th week:**  **Lecture:** Basic structures of PLC  **Practice:** Using the structure of counters, upcounting, downcounting | **6th week:**  **Lecture:** Basic structures of PLC  **Practice:** Using the structures, building in step counters, ring counters |
| **7th week:**  **Lecture:**. Basic structures of PLC  **Practice:** Using internal memory spaces, merkers, merker words, merker flags | **8th week:**  **Midterm exercise**  **Lecture:**  **Practice:** |
| **9th week:**  **Lecture:** Basic structures of PLC  **Practice:** Using comparative blocks, and word-type pointers. | **10th week:**  **Lecture:** Basic structures of PLC  **Practice:** Subroutines |
| **11th week:**  **Lecture:**  **Practice:** Practice of various industry inspired problems. | **12th week:**  **Lecture:**  **Practice:**. Practice of various industry inspired problems. |
| **13th week:**  **End-term task** | **14th week:**  **End-term task** |
| **15th week:**  **End-term task** |  |

**Requirements**

**A, for a signature:**

Attendance at **lectures** is compulsory.

**B, for a mid-semester grade:**

Students have to fulfill a mid-term exercise at least for 50% to take part on the next practice classes. All students, who failed the mid-term exercise will not get a mid-semester grade. At the end of the semester, all students have to solve a real life problem in programming. Also a task, to make a complete documentation of the project file, using all the methods, mentioned during the semester.

The course ends in a **mid-semester grade**. Based on the average of the grades of the tasks.