

**COURSE TITLE: PLC – PROGRAMMABLE LOGIC CONTROLLERS**

**Institute/Division:** Faculty of Automatic Control and Information Technology, E-31  
**Number of contact hours:** 45  
**Course duration:** 1 semester (Fall)  
**ECTS credits:** 6

**Course description:**

The course comprises lectures, laboratory exercises and individual project. It is designed to provide the student with understanding of programmable logic controllers.

**The topics of the lectures include:**

Introduction to programmable logic controllers and programming language. Siemens controllers. Basic and advanced elements of ladder programming language. Ladder diagram and other tools for PLC programming like function block diagram, structured text, instructions list and sequential control language. TIA Portal environment. Inputs and outputs signals. Human machine interface and PLC cooperations in network. Functions and Function Blocks, Data Blocks, Organisation Blocks. Structured and unstructured applications building. Sequential functions charts. Different methods of function charts implementation. Control and monitoring operator panels design and implementations. Examples of industrial control applications. Distributed control applications examples using programmable logic controllers and communications issues. IEC standards. Control applications design standard.

**Literature:** Selected reviews from scientific literature.  
**Course type:** Lectures (20h), laboratory (20h) and project (5h)  
**Assessment method:** Project, laboratory exercises and written exam.  
**Target group:** Students in Computer Science, Control and Electrical Eng.  
**Contact Person:** kschiff@pk.edu.pl