



Course: Programmable Control Systems

Study program:	Academic level 1st cycle study program "Electrical Engineering"	Študijski program:	Univerzitetni dodiplomski študijski program 1. stopnje Elektrotehnika
Code:	64139	Šifra:	64139
Title:	Programmable Control Systems	Naslov:	Programirljivi krmilni sistemi
Year:	3rd	Letnik:	3.
Semester:	Summer	Semester:	poletni
ECTS credits:	5	Kreditne točke ECTS:	5
Lectures (hours):	30	Predavanja (ur):	30
Tutorial (hours):	0	Avditorne vaje (ur):	0
Lab. work (hours):	30	Laboratorijske vaje (ur):	30

Title: Programmable Control Systems

Lecturer: Prof. Dr. David Nedeljković

Aim of the course:

Student will learn about programmable control system components and their features. He will accomplish knowledge to solve control problems by using programmable logic controllers (PLCs), where proper hardware selection/configuration, control software development and user interface are needed.

With systematic approach he will reduce occurrence of deadlocks in controlled process and carefully address all safety issues. As well, student will become aware of necessity of clear requirements, perfect documentation and efficient communication among project staff.

Required (pre)knowledge:

Programming fundamentals, digital systems fundamentals.

Contents:

A brief history of control systems.

Areas of programmable logic control application (industry, energetics, traffic...)

Fundamental and other logical functions: binary, memory, timer, counter.

Application of digital and analog sensors and actuators.

Flowchart and types of control: combination control, step control.

Safety measures.

Concepts and structures of PLCs. Input and output signals, addressing, data types.

Methods of user control software development: statement list (STL), ladder diagram (LAD), function block diagram (FBD). Most important instructions and functions.

Software development tools for user control program development and user interface design.

Supervisory Control And Data Acquisition (SCADA) systems.

Communication among PLCs and other intelligent peripherals.

Selected references:

Hans Berger: Automating with STEP7 in STL and SCL, Publicis MCD Verlag, Erlangen, 2000.

Heinrich Lepers: SPS-Programmierung nach IEC 61131-3. Mit Beispielen für CoDeSys und Step 7, Franzis PC und Elektronik, 2007.