

Module: Automation Systems – PLC-Systems

Level	Bachelor	Short Name	AuSysPLC
Responsible Lecturers	Prof. Dr.-Ing. J.-Christian Töbermann		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Information Technology, Bachelor		
Compulsory/elective	Elective	ECTS Credit Points	5
Semester of Studies	(Unspecified)	Semester Hours per Week	4
Length (semesters)	1	Workload (hours)	150
Frequency	(Flexible)	Presence Hours	60
Teaching Language	English	Self-Study Hours	90

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Portfolio Exam	Exam Language	English
Exam Length (minutes)		Exam Grading System	One-third Grades
Learning Outcomes	The students are able to: <ul style="list-style-type: none"> • to analyze and evaluate automation engineering tasks • to implement common methods and standards of industrial automation engineering, • to characterize hardware and software components of PLC Systems and select them according to the problem, • to apply system-oriented, modular, object-oriented and project-oriented thinking in automation engineering, • use formal description tools and common PLC programming languages 		
Participation Prerequisites			

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	<ul style="list-style-type: none"> ✓ Use of gender-neutral language (THL standard) ✓ Target group specific adjustment of didactic methods ✗ Making subject diversity visible (female researchers, cultures etc.)
Applicability	
Remarks	

Module Course: Automation Systems – PLC-Systems (Lecture)

(of Module: Automation Systems – PLC-Systems)

Course Type	Lecture	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	3,5
Participation Limit		Semester Hours per Week	3
Group Size		Workload (hours)	105
Teaching Language	English	Presence Hours	45
Study Achievements ("Studienleistung", SL)		Self-Study Hours	60
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	<ul style="list-style-type: none"> • Introduction to industrial automation: overview of industrial automation, components of an industrial automation system, automation pyramid, horizontal and vertical integration • Programmable logic controller (PLC): basic architecture, characteristics of frequently used inputs and outputs, hardware configuration • Local, decentralized and distributed PLC-Systems • PLC programming languages according to IEC 61131-3 and standard function blocks • Logic and sequence control • Safety related PLC-Systems and realization of combined PLC/SPLC-Systems
Literature	<p>W. Bolton: Programmable Logic Controllers (last edition)</p> <p>K.H. John, M. Tiegelkamp: IEC 61131-3: Programming Industrial Automation Systems (last edition)</p> <p>Further literature will be named in the lecture.</p>
Remarks	

Module Course: Automation Systems – PLC-Systems (Exercises)

(of Module: Automation Systems – PLC-Systems)

Course Type	Exercise	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	1,5
Participation Limit		Semester Hours per Week	1
Group Size	12	Workload (hours)	45
Teaching Language	English	Presence Hours	15
Study Achievements ("Studienleistung", SL)		Self-Study Hours	30
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	In the exercises during the semester, the students apply what they have learned in the lecture to given or self-study topics for selected application scenarios.
Literature	See lecture
Remarks	