

Course Manual PLTS

Process Control Technology Systems

Version: 1 | Last Change: 28.09.2019 20:55 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

– General information

Long name	Process Control Technology Systems
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Approving CModule	PLTS_BaET
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Responsible	Prof. Dr. Norbert Große <small>Professor Fakultät IME</small>
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Valid from	summer semester 2023
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Level	Bachelor
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Semester in the year	summer semester
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Duration	Semester
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Hours in self-study	78
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ECTS	5
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Professors	Prof. Dr. Norbert Große <small>Professor Fakultät IME</small>
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Requirements	Process Control Planning
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Language	German
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Separate final exam	Yes
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Literature

eigenes Skriptum der Vorlesung (530 Seiten)

Taschenbuch der Automatisierungstechnik, Große,
Schorn, Hanser Verlag

Final exam

Details

The students work together as project teams. Each team works independently under supervision a subject area. Here, the team gains knowledge about the theory, about the practical configuration and the use of devices in the automation of a large plant, especially for the planned SLIM plant in PLT planning.

The topics are drawn for the teams.

Each team will have a laboratory session in which every single student will get familiar with the equipment and systems related to his topic in the lab in order to be able to demonstrate them

practically and to explain their function, operation and purpose.

Datasheets, company information and helpful links to the topics are available and can be accessed. Of course, students can also do their own research.

The explanation of the devices and systems and the handling are part of an examination in the laboratory. This presentation is graded. If this does not have to be taken as passed, the advance payment for the later module examination in the form of an exam is not provided! The team also formulates technical questions for companies that use such devices and systems. Each team member contributes at least one question. The questions are evaluated.

The team then visits a user industry company and discuss the planning and deployment of their own equipment and systems.

Each student should then give their own lecture (10 min + discussion) from the topic area to inform the other listeners (specialization topic). The topics are part of the technical realization of the planned SLIM plant in PLT Planning; the reference to the system should always be established. In a topic area, it makes sense that the first lecture gives an overview and the following lectures deepen the technical details. Each lecture will

then be put up for discussion. In the discussion, the clarified questions from the company are also discussed. The questions of the audience are evaluated.

At the lecture date, the slides are to be handed over as PowerPoint files. Each slide requires text formulated as a note. After all, your fellow students should be able to prepare themselves for inquiries with the help of slides and the text. The PowerPoint file with the notes is included in the assessment.

At the end of the semester, there will be an exam, which recapitulates the material of the lecture and the material of the student lectures. It will give relatively simple questions about measurement principles and the basics that have been taught. For the 33 questions there are 60 minutes of time available, documents may not be taken.

Summary of the rating and shares of the overall grade for PLT systems:
Laboratory test 33%
Lecture with lecture, films, accompanying text, Answers to questions: 33%
Questions to the lecturer
Exam 33%

Minimum standard

Passed laboratory test, lecture held and passed exam

Exam Type

EN andere summarische Prüfungsform



– Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Process Measurement Structural construction Characteristics and communication Temperature measurement, principles by application Pressure measurement, principles by application Speed measuring technology, principles according to application areas Flow measurement technology, principles according to application areas Level measurement technology, principles according to application areas
Knowledge	Process control technology Resistance and source control electrical, hydraulic and pneumatic auxiliary energy Construction of fittings Lay out characteristic curves
Knowledge	Signals continuous-time and discrete-time signals Scaling for automation Design filter
Knowledge	Practical control technology Determine empirically controlled systems Empirically designing the controller Controller Device Technology
Knowledge	Programmable control technology Specify controls using GRAFCET Programming languages according to DIN EN 61131-3 Decision tables according to DIN 66241 States and operating modes of controllers Control device technology

Special requirements

successful completion of the module PLTP

Accompanying material	Notes and schedules for the lecture, Book for the lecture with slides and accompanying text
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Separate exam	Yes
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Separate exam

Exam Type	undefined
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Details	Lecture in the lecture hall
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	Exam at the end of the lecture period
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Minimum standard	Lecture with at least 4 ratings
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	In the exam at least half of the achievable points received
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Expenditure classroom teaching

Type	Attendance (h/Wk.)

Lecture	2
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Exercises (whole course)	1
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Exercises (shared course)	0
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Tutorial (voluntary)	0
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– Practical training

Learning goals

Goal type	Description
Knowledge	make concepts for explosion protection
Knowledge	use Field device communication va HART
Knowledge	use Field device communication va PROFIBUS
Knowledge	use Field device communication va Foundation Fieldbus
Skills	using FDT/DTM via Pactware
Skills	measure parameter on Fieldbus
Skills	operate on distributed control systems
Skills	configure distributed control systems
Skills	Teamwork for the coordination of main topics of the subject areas
Skills	Show competence in dealing with technical systems in the laboratory
Skills	Prepare presentations and hold these represent a technical subject Represent the procedure of detailed planning Represent advantages and disadvantages of the technology Establish reference to sample plant from module PLTP

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Special requirements

successful completion of the module PLTP

Accompanying material Notes and schedules for the internship, Book for the lecture with slides and accompanying text

Separate exam Yes

Separate exam

Exam Type EN Projektaufgabe im Team bearbeiten (z.B. im Praktikum)

Details Laboratory examination of the assigned subject area

Minimum standard passed laboratory tests at least rating 4

