### 2.4.1 Focal Subjects 1

| Focal Subjects 1 |
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| Module Summary |
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| Module code: EEIB410 |
| Module coordinator: Prof. Dr. Leize |
| Credits (ECTS): 4 Points |
| Semester: 4. Semester |
| Pre-requisites with regard to content:<br>None |
| Pre-requisites according to the examination regulations:<br>Regarding to the examination regulations no pre-requisites are required |
| Competencies:<br>In the Focal Subjects, the students choose from the available elective subjects. The competencies result from these. It is also possible to choose from the german elective subjects of the EITB course. |
| Assessment:<br>Results according to the chosen subjects. |

| Course: Focal Subjects 1 |
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| Module code: EEIB411 |
| Lecturer: verschiedene |
| Scope of weekly semester hours (SWS): 4 |
| Semester of delivery: Summer semester |
| Type/mode: Lecture, Elective subject |
| Language of instruction: English |
| Content: The content results from the chosen subjects |
| Recommended reading:<br>See Module book according to chosen subjects. |

#### 2.4.1.1. Elective Subject: Applied Control

| Applied Control |
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| Module overview |
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| Module code: NN, (EITB440A, German course) |

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| Module Responsible(s): Prof. Dr. Philipp Nenninger |
| Module scope (ECTS): 7 points |
| Classification (semester): 4th semester |
| Content Requirements:<br>Knowledge of the modules Fundamentals of Computer Science 1, Computer Engineering, Digital Technology. |
| Prerequisites as per SPO:<br>According to SPO, no formal requirements are necessary. |
| Competencies:<br>Participants will be able to implement applications on programmable logic controllers by<br>a) Be able to map requirements to switchgear and switching networks<br>b) Know special features of the PLC computer class<br>c) master various IEC61131 programming languages and be able to select a suitable one according to the problem.<br>To be able to design, implement and commission technical systems based on programmable logic controllers. |
| Examination Credits:<br>The students' theoretical knowledge and their knowledge acquired in the laboratory are assessed in a written exam (duration 120 min). The practical skills are evaluated in the laboratory experiments by colloquia and by written reports on each laboratory experiment. |
| Usability:<br>In this module, the focus is on the methods of classical control technology (switching networks) and their mapping to the computer type "programmable logic controller (PLC)". The modeling of technical processes in graphical and mathematical form and the cross-system view, on the other hand, are anchored as the main focus in the "Automation Technology" module. |

| **Course: Applied Control** |
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| Module Code: NN, (EIT441A, German Course) |
| Lecturer(s): Prof. Dr. Philipp Nenninger |
| Scope (SWS): 4 |
| Cycle: Summer semester |
| Type, mode: lecture, compulsory subject |
| Teaching language: English |
| Contents:<br>• System overview: Components of an automation system<br>• Number representations, coding systems<br>• Data formats according to IEC standard<br>• Programming model of the PLC<br>• Design methods for switching networks and switching stations |
| Recommended reading: |

- Seitz, M.: Programmable logic controllers, Fachbuch-verlag Leipzig, 2003
- Wellenreuther; Zastrow: Automatisieren mit SPS, Vieweg 2001, (ISBN 3-528-03910-8)
- Berger, H.: Automation with STEP 7 in IL and SCL, Siemens ed. Publicis Corporate Publishing, (ISBN 3-89578-197-5)
- Braun, W.: Programmable logic controllers in practice, Vieweg, 1999
- Borucki, L.: Digital Technology, Teubner, (ISBN 3-519-36415-8)
- Hertwig, A.; Brück, R.: Entwurf digitaler Systeme, Hanser, (ISBN 3-446-21406-2).


| **Course: Applied Control Lab** |
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| EDP designation: EITB442A |
| Lecturer(s): Prof. Dr. Philipp Nenninger and lecturers |
| Scope (SWS): 2 |
| Cycle: Summer semester |
| Type, mode: laboratory, compulsory subject |
| Teaching language: English |
| Contents:<br>Try to:<br>• Design, project planning and programming of control engineering solutions for a process model from manufacturing automation<br>• Testing and commissioning of hardware and software for a sub-process (each participant group for itself)<br>• Integration test and commissioning of the overall process model (all participants together) |
| Recommended reading:<br>• Seitz, M.: Programmable logic controllers, Fachbuchverlag Leipzig, 2003<br>• Wellenreuther; Zastrow: Automatisieren mit SPS, Vieweg 2001, (ISBN 3-528-03910-8)<br>• Berger, H.: Automation with STEP 7 in IL and SCL, Siemens ed. Publicis Corporate Publishing, (ISBN 3-89578-197-5)<br>• Braun, W.: Programmable logic controllers in practice, Vieweg, 1999<br>• Borucki, L.: Digital Technology, Teubner, (ISBN 3-519-36415-8)<br>• Hertwig, A.; Brück, R.: Entwurf digitaler Systeme, Hanser, (ISBN 3-446-21406-2). |