# Course Manual EG

Basic Electrical Engineering for Computer Science and Engineering

Version: 1 | Last Change: 16.09.2019 14:25 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

## — General information

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|---|---|
| **Long name** | Basic Electrical Engineering for Computer Science and Engineering |
| **Approving CModule** | EG_BaTIN |
| **Responsible** | Prof. Dr. Lothar Thieling<br>Professor Fakultät IME |
| **Valid from** | winter semester 2020/21 |
| **Level** | Bachelor |
| **Semester in the year** | winter semester |
| **Duration** | Semester |
| **Hours in self-study** | 60 |
| **ECTS** | 5 |
| **Professors** | Prof. Dr. Lothar Thieling<br>Professor Fakultät IME |
| **Requirements** | none |
| **Language** | German |
| **Separate final exam** | Yes |

### Literature

Gert Hagman, Grundlagen der Elektrotechnik, AULA-Verlag, ISBN 978-3-89104-747-7

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### Final exam

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|---|---|
| **Details** | The students should demonstrate the following competencies in a written exam: 1.) Safe handling of concepts and mechanisms. 2.) Analysis of given electrical and electronic circuits. |
| **Minimum standard** | At least 50% of the total number of points |
| **Exam Type** | EN Klausur |

## Lecture / Exercises

### Learning goals

| Goal type | Description |
|-----------|-------------|
| Knowledge | The students are able to analyze electrical and electronic systems in respect to the essential functionality and to classify and estimate their behavior. <br> In particular, students are able perform these analyzes according to following topics: <br> - resistor <br> - voltage and current sources <br> - Kirchhoff's circuit laws, serial and parallel <br> - electrical power and efficiency <br> - real electrical sources including operating point <br> - network analysis <br> - electric field <br> - magnetic field <br><br> - inductors and capacitors <br> - apparent power and reactive power <br> - Switching in simple RCL networks <br> - AC <br> - transformer <br> - generator <br> - DC motor <br><br> - ideal diode <br> - real diode (modeled using an ideal diode and voltage source and resistor) <br> - ideal transistor <br> - real transistor <br> - operational amplifier and corresponding basic wirings |

### Special requirements

| | |
|---|---|
| **Accompanying material** | undefined |
| **Separate exam** | No |

### Expenditure classroom teaching

| Type | Attendance (h/Wk.) |
|------|--------------------|
| Lecture | 2 |
| Exercises (whole course) | 1 |
| Exercises (shared course) | 1 |
| Tutorial (voluntary) | 0 |

## – Practical training

### Learning goals

| Goal type | Description |
|---|---|
| Skills | The students carry out electrotechnical experiments in related projects. The aim of the given experiments is the understanding of the function and the measurement of an electrotechnical and / or electronical system. |

### Expenditure classroom teaching

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

### Special requirements

| | |
|---|---|
| **Accompanying material** | problem and task description (electronic) |
| **Separate exam** | No |