Course Specifications
Valid as from the academic year 2019-2020

Course (nominal values; actual values may depend on programme)

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
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<tbody>
<tr>
<td>3.0</td>
<td>90 h</td>
<td>30.0 h</td>
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Course offerings and teaching methods in academic year 2019-2020

A (semester 2)  Dutch  
lecture  18.0 h  
seminar  12.0 h

Lecturers in academic year 2019-2020

Verhaevert, Jo  TW05  lecturer-in-charge

Offered in the following programmes in 2019-2020

| Bachelor of Science in Engineering Technology (main subject Chemical Engineering Technology) | 3  | A |
| Bachelor of Science in Engineering Technology (main subject Civil Engineering Technology) | 3  | A |
| Bachelor of Science in Engineering Technology (main subject Electromechanical Engineering Technology) | 3  | A |
| Bachelor of Science in Engineering Technology (main subject Electronics and ICT Engineering Technology) | 3  | A |
| Bachelor of Science in Engineering Technology (main subject Information Engineering Technology) | 3  | A |
| Joint Section Bachelor of Science in Engineering Technology | 3  | A |

Teaching languages
Dutch

Keywords
Electronics

Position of the course
The course has the following objectives:

- Acquire basic knowledge in the field of electronics and gain insight in its recent developments.
- Be able to describe and to analyse diverse electronic systems and their components in the domain of everyday electronics.
- During the seminars, theoretical principles are practiced and realistic electronic circuits are calculated. The obtained results are compared with simulations. Operational and non-operational circuits are examined by means of data sheets to analyse and to prevent errors.

Contents

- Introduction: history, electricity versus electronics, important quantities, basic components
- Semiconductor technology: the atom model, N-type and P-type semiconductors, the PN-junction
- Diodes and applications: diode operation, voltage-current characteristics, diode models, rectifier circuits and other applications
- Special-purpose diodes: Zener, varactor, optical diode
- Bipolar Junction Transistors: basic BJT operation, characteristics and parameters, the BJT as amplifier, the BJT as switch, phototransistor
- Transistor circuits: DC operating point, bias methods, common-emitter amplifier, common-collector amplifier, common-base amplifier
- Field-Effect Transistors: JFET characteristics and parameters, MOSFET characteristics and parameters
- Thyristors: four-layer diode, Silicon-controlled rectifier (SCR), diac, triac, silicon-
Initial competences

Builds upon certain final competences of the course 'Electricity'.

Final competences

1. Recognise and analyse electronic systems.
2. Explain the operation principles of electronic semiconductor components, such as the diode, the transistor and the thyristor.
3. Explain the operation of basic diode, transistor and thyristor circuits.
4. Be able to independently analyse a basic electronic system.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment.

Conditions for exam contract

This course unit cannot be taken via an exam contract.

Teaching methods

Lecture, seminar

Learning materials and price

• Hand-outs of the slides and additional documentation are available on the electronic learning environment.

References

Course content-related study coaching

The lecturers are available for further information via various channels (during and/or after the course or by appointment).

Evaluation methods

end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period

Written examination with multiple choice questions

Examination methods in case of periodic evaluation during the second examination period

Written examination with multiple choice questions

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

Written examination with multiple choice questions. Mainly, the insight and links between the different offered themes are tested.

Calculation of the examination mark

100% examination

(Approved)