

## Electronics (E701055)

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

**Credits 3.0**                      **Study time 90 h**

**Course offerings and teaching methods in academic year 2023-2024**

A (semester 2)	Dutch	Gent	seminar lecture
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**Lecturers in academic year 2023-2024**

Verhaevert, Jo	TW05	lecturer-in-charge
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**Offered in the following programmes in 2023-2024**

	<b>crdts</b>	<b>offering</b>
<a href="#">Bachelor of Science in Engineering Technology(main subject Chemical Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology(main subject Civil Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology(main subject Electromechanical Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology(main subject Electronics and ICT Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology(main subject Information Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology (Joint Section)</a>	3	A

**Teaching languages**

Dutch

**Keywords**

Semiconductor technology, diodes, bipolar transistors, field-effect transistors, diode circuits, transistor circuit

**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

**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 and the transistor.
- 3 Explain the operation of basic diode and transistor 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**

Seminar, Lecture

**Learning materials and price**

- English textbook: Electronic devices, conventional current version, Thomas L. Floyd, 10th edition (ISBN-13: 978-1-29-222299-8), Pearson Global Edition (70 euro)
- Syllabus seminars (4 euro)
- 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).

**Assessment moments**

end-of-term assessment

**Examination methods in case of periodic assessment during the first examination period**

Written assessment with multiple-choice questions

**Examination methods in case of periodic assessment during the second examination period**

Written assessment with multiple-choice questions

**Examination methods in case of permanent assessment****Possibilities of retake in case of permanent assessment**

not applicable

**Calculation of the examination mark**

Written assessment with multiple-choice questions: 100%