

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

Lecturers in academic year 2023-2024

Verhaevert, Jo

TW05

lecturer-in-charge

Offered in the following programmes in 2023-2024

[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

[Bachelor of Science in Engineering Technology \(Joint Section\)](#)

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%