

Electrical Circuits and Networks (E090320)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)
Credits 6.0 Study time 180 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	Dutch	Gent	seminar: coached exercises	30.0 h
			lecture	30.0 h

Lecturers in academic year 2020-2021

Neyts, Kristiaan TW06 lecturer-in-charge

Offered in the following programmes in 2020-2021

	crdts	offering
Bachelor of Science in Engineering (main subject Biomedical Engineering)	6	A
Bachelor of Science in Engineering (main subject Computer Science Engineering)	6	A
Bachelor of Science in Engineering (main subject Electrical Engineering)	6	A
Bachelor of Science in Engineering (main subject Electromechanical Engineering)	6	A
Bachelor of Science in Engineering (main subject Engineering Physics)	6	A
Bachelor of Science in Computer Science Engineering	6	A
Bachelor of Science in Electrical Engineering	6	A
Bachelor of Science in Engineering Physics	6	A
Bachelor of Science in Electromechanical Engineering	6	A
Bridging Programme Master of Science in Engineering Physics	6	A
Preparatory Course Master of Science in Biomedical Engineering	6	A
Preparatory Course Master of Science in Industrial Engineering and Operations Research	6	A
Preparatory Course Master of Science in Photonics Engineering	6	A
Preparatory Course European Master of Science in Photonics	6	A

Teaching languages

Dutch

Keywords

electrical circuits, electronic components

Position of the course

A basic course for engineering students, it aims mainly at familiarize the students with electrical circuits, as well in DC and sine regime as with transient phenomena. It also aims at gaining practical skills for solving networks. An introduction to electronic basic components.

Contents

- General network methods.
- Dynamics of networks.
- Systematic analysis methods.
- Electrical power.
- Network functions.
- Some specific electrical networks.

- Numerical analysis of circuits with PSPICE.
- Electronic components.

Initial competences

Students have successfully taken the course 'Basis Mathematics Tools' ('Wiskundige basistechniek') (i.e. obtained a credit) or have acquired the aspired learning competences in another way (mandatory succession as defined in the Curriculum Rules of the Faculty of Engineering and Architecture, cf. <http://www.ugent.be/ea/nl/onderwijs/studentenadministratie/curriculum.htm>)

Final competences

- 1 Draw amplitude and phase Bode diagrams for transfer functions and determine the poles and zeros.
- 2 Analyze linear circuits with resistors, (coupled) inductors and capacitors in dc, in the periodic regime and during transients.
- 3 Determine the balance of active and reactive electrical power in a three-phase electrical network.
- 4 Analyze basic electrical circuits containing diodes, bipolar transistors and MOSFETs.

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: coached exercises, online seminar

Extra information on the teaching methods

online work college: solving online exercises with CASTr

Learning materials and price

Lecture notes (distributed by VTK, cost about 8 euro)

References

- Howatson, "Electrical Circuits and Systems", Oxford University Press, 1996
- De Carlo and Lin, "Linear Circuit Analysis", 2nd. ed., Oxford University Press, New-York, 2001

Course content-related study coaching

Individual tutoring about the exercises is available during practical sessions. The lecturer is available before and after lectures. Additional personal coaching is available on request (e-mail).

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Skills test

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

During examination period: written, closed-book examination. A limited set of formulas is available.

Outside of examination period: obligation to solve exercises (pass /fail)

Calculation of the examination mark

The final score is a weighted average of the scores on the exam exercises. *The calculation of the final score can differ, due to the COVID19 context, especially if one or more evaluations can not be organised on campus or can not be organised at all.*