

## Electrical Circuits and Networks (E090320)

**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 2016-2017**

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

**Lecturers in academic year 2016-2017**

Neyts, Kristiaan	TW06	lecturer-in-charge
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**Offered in the following programmes in 2016-2017**

	crdts	offering
<a href="#">Bachelor of Science in Computer Science Engineering</a>	6	A
<a href="#">Bachelor of Science in Electrical Engineering</a>	6	A
<a href="#">Bachelor of Science in Engineering Physics</a>	6	A
<a href="#">Bachelor of Science in Electromechanical Engineering</a>	6	A
<a href="#">Bridging Programme Master of Science in Engineering Physics</a>	6	A
<a href="#">Preparatory Course Master of Science in Industrial Engineering and Operations Research</a>	6	A
<a href="#">Preparatory Course Master of Science in Photonics Engineering</a>	6	A
<a href="#">Preparatory Course European Master of Science in Photonics</a>	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

#### **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

#### **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**

#### **Possibilities of retake in case of permanent evaluation**

not applicable

#### **Extra information on the examination methods**

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

#### **Calculation of the examination mark**

The final score is a weighted average of the scores on the exam exercises.