

# Course Specifications

From the academic year 2019-2020 up to and including the

## Signals and Systems (E620049)

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 2)	Dutch	Kortrijk	practicum	12.0 h
			lecture	48.0 h

Lecturers in academic year 2020-2021

Gevaert, Wouter	TW06	staff member
Raeymaekers, Tim	TW06	staff member
Beyens, Jan	TW05	lecturer-in-charge

Offered in the following programmes in 2020-2021

	crdts	offering
<a href="#">Bachelor of Science in Engineering Technology (main subject Electronics and ICT Engineering Technology)</a>	6	A

Teaching languages

Dutch

Keywords

Analysis, Fourier, Laplace, Systems, Transformations

Position of the course

This course includes two parts: one part continuous signal processing and a second part mathematics (mathematics 3) This signal processing deals with the standard signal processing techniques for signals in the time domain and the frequency domain as well as the transformation techniques between the two. Also links to communications that will be further developed in later courses are formed. In the part mathematics the most important techniques of continuous mathematics and mathematical principles are discussed, which are essential for an engineer both in the time domain and in the frequency domain. The course can be understood as a basic course that contains the necessary mathematical tools. The aim of this course is to establish the fundamentals of techniques, solutions and calculation methods that are required specifically in the electronics educations. The emphasis is not to reproduce the theory but the understanding of it with many attention for exercises.

Contents

signalprocessing (3h/week)

Theory:

- Classification of signals
- Exponential signals
- Networking under exponential regime
- Frequency spectrum of periodic signals:
- dirac pulse, sample function, sinc function, pulse train
- Frequency spectrum of energy signals : Fourier Transform
- Energy and power spectrum
- Main Fourier Spectra
- Basic system properties: impulse response, convolution integral
- Frequency domain concepts: transfer function, system functions

lab: Simulation Exercises with CAD tools such as Matlab

mathematics 3 (2h/week)

- Vector functions: gradient, divergence, curl, Laplacian
- Series Taylor and MacLaurin

- Fourier series
- Laplace
- Line integrals
- Exercises on the theory in the lectures

#### Initial competences

Having successfully completed the courses Electricity and Electrical and electronic building blocks or acquired the desired competencies in some other way. The student should be familiar and have sufficient knowledge of the parts learned in the courses mathematics 1, 2 mathematics 2 and informatics.

#### Final competences

- 1 Can make exercises with pen and paper.
- 2 Knows the construction and representation of signals in the time domain and frequency domain and the transformation between the two techniques
- 3 Can describe the response of signals and systems in the time domain and frequency domain domain
- 4 Can scientific terminology in general and that of mathematics and signal technology particularly handle in Dutch and English
- 5 Can describe the properties of systems by means of transfer functions- and system functions
- 6 To be able to solve mathematical exercises similar to those treated in de colleges

#### 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, practicum

#### Extra information on the teaching methods

Theory: lectures  
Lab: practicum:

#### Learning materials and price

Signalprocessing Theory: course and notes available at the electronic learning environment  
Laboratory Signal Processing: and notes from Ing. Wouter Gevaert (available at the electronic learning environment)  
Mathematics 3 Theory : course and notes by Prof. Dr. Philippe Bocher (available on the electronic learning environment)

#### References

#### Course content-related study coaching

Interactive (exercises), personally after oral or electronic appointment

#### 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

Oral examination, report

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

examination during the second examination period is possible in modified form

#### Extra information on the examination methods

First chance:  
PE1 - Theory: written examination  
NPE - Lab : evaluation of the report  
Second chance::

PE2 - Theory: written examination  
NPE - Lab: evaluation of the report

#### Calculation of the examination mark

60% theory + 40 % lab

- In order to pass the course at least 8/20 for both theory and lab must be achieved. If this requirement is not met the calculated figure if 10 or more becomes a 9 for the student.
- 80% of the result If examination during the second examination period for the lab is then transferred.