Course Specifications

Valid as from the academic year 2020-2021

Signals and Systems II (E702060)

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	Study time	Contact hrs
3.0	90 h	30.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)	Dutch	Gent	lecture: plenary exercises	12.0 h
			lecture	18.0 h

Lecturers in academic year 2020-2021

Van Baelen, Dries	TW05	staff member
Beyens, Jan	TW05	lecturer-in-charge

Offered in the following programmes in 2020-2021	crdts	offering
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
Linking Course Master of Science in Electrical Engineering Technology (main subject Automation)	3	A
Linking Course Master of Science in Electrical Engineering Technology (main subject Electrical Engineering)	3	A
Linking Course Master of Science in Electronics and ICT Engineering Technology (main subject Electronics Engineering)	3	A
Linking Course Master of Science in Electronics and ICT Engineering Technology (main subject Embedded Systems)	3	A
Linking Course Master of Science in Electronics and ICT Engineering Technology (main subject ICT)	3	A

Teaching languages

Dutch

Keywords

Discrete time, Fourier-analysis, Z-transform, state space modelling, random signals, power spectral density.

Position of the course

This course is an expansion of the general course on ‘Signals and Systems’, now also paying attention to discrete time signals and systems, state-space modelling and random signals and systems. This course is interdisciplinary.

Contents

Classification of signals and systems in discrete time
Linear time-invariant systems in discrete time: response, convolution, eigenfunctions.
Z-transform and solving lineair difference equations with constant coefficients.
Fourieranalysis of signals and systems in discrete time
Description and analysis of LTI-systems according to state-space modelling
Introduction to the description and analysis of stochastic signals and systems

Initial competences

Signals and Systems

Final competences

1 Correlate different scientific and technical disciplines with each other.

2 Analyse the interaction between signals and systems in discrete time through convolution.
3 Analyse the interaction between signals and systems in a complex frequency domain (Z-transform).
4 Analyse signals and systems in discrete time through Fourier theory.
5 Describe and analyse LTI-systems according to state-space modelling.
6 Define the methods used to describe and analyse stochastic signals and systems.

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, lecture: plenary exercises, online lecture, online lecture: plenary exercises

Extra information on the teaching methods

Lecture: 18 hrs
Plenary exercises: 12 hrs

Learning materials and price

Handbook: Signals and Systems, Schaum's Outline Series (ca 20 euro)

References

"Linear Systems and Signals", B.P. Lathi, Oxford Press
"Signals and Systems - analysis using transform methods and Matlab", M.J. Roberts, Mc Graw-Hill
"Signals and Systems" (2nd ed), Haykin & Van Veen, John Wiley & Sons

Course content-related study coaching

The lecturer is available during or in between lectures; there is assistance during the exercise-sessions. Individual assistance is provided on demand (by appointment).

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

PE1 en PE2: written examination in 2 parts (theory and exercises)
Theory : closed book (50%)
Exercises: open book (50%)

Calculation of the examination mark

First examination Period: theory (50%) + exercises (50%)
Second examination Period: theory (50%) + exercises (50%)