GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Signals and Systems II (E702060)

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 2026-2027

A (semester 2)	Dutch	Gent	lecture

Lecturers in academic year 2026-2027

Huynen, Martijn	TWO5	lecturer-in-charge

Offered in the following programmes in 2026-2027	**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

Seminar, Lecture

Extra information on the teaching methods

- Lecture: 18 hrs
- Plenary exercises: 12 hrs

Study material

Type: Handbook

Name: Schaum's outline of signals and systems
Indicative price: Free or paid by faculty
Optional: no
Language : English
Author : Hwei Hsu
Number of Pages : 496
Oldest Usable Edition : 2nd Edition
Online Available : No
Available in the Library : Yes
Available through Student Association : Yes
Usability and Lifetime within the Course Unit : intensive
Usability and Lifetime within the Study Programme : regularly
Usability and Lifetime after the Study Programme : occasionally
Additional information: Same book as for Signals and Systems so everyone has this book already

Type: Slides

Name: Signalen en Systemen 2
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No
Additional information: slides for both theory and exercises

Type: Audiovisual Material

Name: Signalen en Systemen 2
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Available on Ufora : Yes
Online Available : No
Available through Student Association : No
Additional information: course recordings 2022-2023

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).

Assessment moments

end-of-term assessment

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

Written assessment

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

Written assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

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%)