GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2024-2025

Signal Processing (E010010)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 2)	English	Gent	lecture seminar practical

Lecturers in academic year 2024-2025

Madhu, Nilesh	TWO6	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Bachelor of Science in Engineering(main subject Electrical Engineering)	6	A
Master of Science in Computer Science Engineering	6	A

Teaching languages

English

Keywords

signal processing, digital filters, DFT, spectral analysis, non-stationary signals and systems

Position of the course

Learn how to apply signal models for the solution of diverse problems in signal processing. Learn to design signal processing systems from specifications.

Contents

- Signal models: Signal spaces, signal transformations, applications
- Digital-filter design: IIR and FIR filters; multirate filtering
- The DFT and its applications: FFT, fast convolution, filtering in frequency domain, cepstrum
- Spectral signal analysis
- Non-stationary signals and systems

Initial competences

This course builds further upon the concepts introduced in the course "Systems and Signal Analysis"

Final competences

1 Understand and correctly interpret signal processing methods and models
2 Understand and apply digital filter design methods
3 Convert a realistic problem statement into signal processing system specifications
4 Selection of the best design method for accomplishing certain system requirements
5 Inventarisation and comparison of suitable methods for solving a specific problem

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, Practical

Study material

Type: Syllabus

Name: Course material - Signal processing
Indicative price: Free or paid by faculty
Optional: yes
Language : Dutch
Number of Pages : 214
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No
Additional information: Older course material (in Dutch), serving as a stop-gap till my own text is completed. This complements the slides and, as such, is not compulsory for the course but can serve as additional reading.

Type: Slides

Name: Course slides - Signal processing
Indicative price: Free or paid by faculty
Optional: no
Language : English
Number of Slides : 650
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No
Additional information: Slides that contain the main course material. This is the material that will be discussed in class.

References

- Alan V. Oppenheim & Ronald W. Schafer. Discrete-Time Signal Processing, (2nd or 3rd edition), Pearson Education Limited, 2009, ISBN-13: 9780131988422
- J. Proakis & D. Manolakis. Digital Signal Processing : Principles, algorithms & applications (2nd edition). Macmillan, 1992

Course content-related study coaching

The instructor is available for discussion and clarifications before and after the class. He may also be contacted by email.

Assessment moments

end-of-term and continuous assessment

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

Written assessment with open-ended questions

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

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

During examination period: Closed-book exam. However: students are allowed to bring with them four (4) A4-sheets of paper (double-sided) with handwritten notes. No photocopies, printouts etc. allowed.
During semester: graded project reports. Second chance: Not possible

Calculation of the examination mark

The final score is based on a weighted average of the score obtained for the computer projects and the score obtained in the final exam. However, students must pass both parts to pass the course.
Calculation of score:

- Weight of computer projects = 1/2
- Weight of final exam = 1/2

If the score on any one component (projects or written exam) is less than 50%,

then the final score will be reduced to 9/20.
If the score on the written exam is less than 40% then the final score will be reduced to the lowest score of 7/20, such that it cannot be considered for deliberation.