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 2023-2024

A (semester 2)	English	Gent	lecture
			practical
			seminar

Lecturers in academic year 2023-2024

| Madhu, Nilesh | TW06 | lecturer-in-charge |

Offered in the following programmes in 2023-2024	**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

Learning materials and price

Course notes and slides will be made available on the digtal learning platform.

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.