

Advanced Image and Signal Processing (E092841)

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 3.0 Study time 90 h Contact hrs 25.0 h

Course offerings and teaching methods in academic year 2020-2021

Offering	Language	Location	Teaching Method	Hours
A (semester 1)	English	Gent	lecture	20.0 h
			seminar: practical PC room classes	5.0 h
B (semester 1)	Dutch		guided self-study	20.0 h
			seminar: practical PC room classes	5.0 h

Lecturers in academic year 2020-2021

Vandenberghe, Stefaan	TW06	lecturer-in-charge
Vandemeulebroucke, Jef	VUB	co-lecturer

Offered in the following programmes in 2020-2021

Programme	crdts	offering
Master of Science in Biomedical Engineering	3	A, B
International Master of Science in Biomedical Engineering	3	A, B
Master of Science in Biomedical Engineering	3	A, B

Teaching languages

Dutch, English

Keywords

advanced signal and image processing, image reconstruction

Position of the course

The goal of this course is to gain insight into different advanced methods for image and signal processing and to apply these techniques to biomedical data.

Contents

- Introduction
- Image restoration: blind and other deconvolution methods
- Advanced image reconstruction: analytical and iterative methods
- Beeldregistratie en multimodale beeldvorming
- Multimodal medical image/signal processing for biomedical applications
- Feature extraction, Computer Aided Diagnosis and radiomics

Initial competences

basics of image and signal processing

Final competences

- 1 Restore images and identify best deconvolution methode
- 2 Understand advantages and disadvantages of different reconstruction methods
- 3 Insight into limitations and possibilities of image registration techniques
- 4 Combine different image and signal methods for multimodal medical data
- 5 Insight into limitation and possibilities of advanced image processing methods(CAD and Radiomics)

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

Guided self-study, lecture, seminar: practical PC room classes

Extra information on the teaching methods

Powerpoint presentations
Matlab practica

Learning materials and price

Powerpoint slides
Review papers

References

Digital image processing, Prentice hall
Fundamentals of digital image processing, Prentice hall

Course content-related study coaching

By teacher and assistants. Communication by mail or the electronic learning environment

Evaluation methods

end-of-term evaluation and continuous assessment

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

Oral examination

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

Oral examination

Examination methods in case of permanent evaluation

Report

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

During examination period: oral exam with written preparation. During semester: evaluation of report practical sessions.

Calculation of the examination mark

PE1: 75 %
NPE1: 25%

PE2: 100%