

## Quantitative Cell and Tissue Analysis (E074011)

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 6.0 Study time 180 h Contact hrs 67.5 h

### Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	English	Gent	lecture	45.0 h
			practicum	22.5 h

### Lecturers in academic year 2020-2021

Van Criekinge, Wim	LA26	staff member
Skirtach, Andre	LA25	lecturer-in-charge
Hendrix, An	GE38	co-lecturer

### Offered in the following programmes in 2020-2021

	crdts	offering
Bachelor of Science in Engineering (main subject Biomedical Engineering)	6	A
Brugprogramma Master of Science in Bioinformatics (main subject Engineering)	6	A
Master of Science in Electrical Engineering (main subject Communication and Information Technology )	6	A
Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)	6	A
Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)	6	A
Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)	6	A
Master of Science in Bioinformatics (main subject Engineering)	6	A
Master of Science in Electromechanical Engineering (main subject Maritime Engineering)	6	A
Master of Science in Electromechanical Engineering (main subject Mechanical Construction)	6	A
Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)	6	A
Master of Science in Chemical Engineering	6	A
Master of Science in Computer Science Engineering	6	A
Master of Science in Computer Science Engineering	6	A
European Master of Science in Photonics	6	A
Master of Science in Chemical Engineering	6	A
Preparatory Course Master of Science in Biomedical Engineering	6	A

### Teaching languages

English

### Keywords

Cell biology, histology, microscopy, DNA-analysis

### Position of the course

This course builds on the contents of From Genome tot Organism and focuses on the principles behind and the application of quantitative techniques for the analysis and assessment of the structure and function of cells and tissues.

### Contents

- Cell and tissue culture techniques

- Enzyme and Enzyme kinetics
- Histology and histological techniques
- Light microscopy techniques
- Electron microscopy
- Cell biomechanics and atomic force microscopy
- Molecular spectroscopy, mass spectrometry and chromatography
- DNA-sequencing
- PCR (Polymerase Chain Reaction) and qPCR, electrophoresis and blotting
- Introduction into genomics and proteomics
- High-throughput and lab-on-chip technologies

#### Initial competences

From Genome to Organism, Optics

#### Final competences

- 1 Understand the working principles of techniques to culture cells and tissues
- 2 Understanding of histology and histological techniques and being able to interpret histological coupes
- 3 Understand various quantitative techniques for the quantitative analysis of cell morphology, cell properties, structure and function and be able to apply quantitative analysis
- 4 Understand the relation between cell composition and cell function as inferred from the above mentioned technique

#### 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, practicum

#### Extra information on the teaching methods

Classroom lectures and laboratory sessions

#### Learning materials and price

lecture notes and/or PPT-slides

#### References

- "Molecular Cell Biology", 5th edition. Lodish, Berk, Matsudaira, Krieger, Scott, Zipursky, Darnell, Freeman NY, 2003
- "Physical biology of the cell", 2nd Edition. R. Phillips, J. Kondev, J. Theriot, H. G. Garcia. Publisher: Garland Science, 2013
- Junqueira's Basic Histology-Text and Atlas. Anthony Mescher, Mcgraw-Hill Education
- General techniques of cell culture. Harrison & Maureen A. Cambridge University Press
- PDF papers and reviews in top ranked journals: nature, science, cell etc..
- Hand-outs

#### Course content-related study coaching

#### Evaluation methods

end-of-term evaluation and continuous assessment

#### 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

Skills test

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

#### Extra information on the examination methods

During examination period: written closed-book exam.

Practical exercises are obligatory. Not participating in periodical and/or non-periodical evaluations, may result in failure for this course.

Calculation of the examination mark

Evaluation during examination period (90 %), evaluation during practica (10%)