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.

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

<table>
<thead>
<tr>
<th>Programme</th>
<th>Credits</th>
<th>Offering</th>
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<tbody>
<tr>
<td>Bachelor of Science in Engineering (main subject Biomedical Engineering)</td>
<td>6</td>
<td>A</td>
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<tr>
<td>Bridging Programme Master of Science in Bioinformatics (main subject Engineering)</td>
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<tr>
<td>Master of Science in Electrical Engineering (main subject Communication and Information Technology)</td>
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<td>Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)</td>
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<td>Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)</td>
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<tr>
<td>Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)</td>
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<tr>
<td>Master of Science in Bioinformatics (main subject Engineering)</td>
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<td>Master of Science in Electromechanical Engineering (main subject Maritime Engineering)</td>
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<td>Master of Science in Electromechanical Engineering (main subject Mechanical Construction)</td>
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<td>Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)</td>
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<td>Master of Science in Chemical Engineering</td>
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<td>Master of Science in Computer Science Engineering</td>
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<tr>
<td>European Master of Science in Photonics</td>
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<tr>
<td>Master of Science in Chemical Engineering</td>
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<td>A</td>
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<tr>
<td>Preparatory Course Master of Science in Biomedical Engineering</td>
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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

(Approved)
• 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
  • 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%)