

BIOENG-449 **Tissue engineering**

Frey Peter

| Cursus | Sem. | Type |
|----------------|----------|------|
| Bioengineering | MA2, MA4 | Opt. |

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|----------------------------|-----------------|
| Language of teaching | English |
| Credits | 4 |
| Session | Summer |
| Semester | Spring |
| Exam | Written |
| Workload | 120h |
| Weeks | 14 |
| Hours | 3 weekly |
| Courses | 2 weekly |
| Exercises | 1 weekly |
| Number of positions | |

Summary

Introduction into theoretical and practical aspects of Tissue Engineering and Regenerative Medicine with particular interest in organ tissue engineering

Content

Multidisciplinary lectures covering pre- and postnatal tissue engineering in urology, for diaphragmatic hernia, pancreatic, and cartilage and bone regeneration.

Further, growth factor and stem cell biology as well as bioreactor technology for tissue engineering application will be discussed.

In addition specific matrix biology for tissue engineering products, in particular the fibrin technology will be evocated, with a particular interest in the prevention of scar tissue formation.

Presentation of ethical issues in regenerative medicine.

Keywords

Tissue engineering
Molecular biology
Growth factor biology
Stem cell biology
Clinical application
Fetal Medicine
Congenital malformation

Learning Prerequisites**Required courses**

Bachelor

Recommended courses

Molecular biology
Polymer science

Learning Outcomes

By the end of the course, the student must be able to:

- Operate tissue engineering tasks
- Conduct a minor tissue engineering project

- Conduct an ethical review
- Translate theory into practice of tissue engineering

Transversal skills

- Access and evaluate appropriate sources of information.
- Communicate effectively with professionals from other disciplines.
- Communicate effectively, being understood, including across different languages and cultures.

Teaching methods

Course ex cathedra and tissue engineering personal projects

Expected student activities

Individual or group preparation of essays (exercises), which will be presented to the Tissue Engineering Class students at the end of the course

Assessment methods

Essay presentation

Final written exam in form of a open-book essay

Supervision

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|--------------|-----|
| Office hours | Yes |
| Assistants | Yes |
| Forum | No |

Resources

Bibliography

Tissue Engineering

Academic Press Series in Biomedical Engineering

Clemens van Blitterswijk, Senior Editor

Ressources en bibliothèque

- [Tissue Engineering / Van Blitterswijk](#)

Notes/Handbook

Access to slides and videos on Moodle

Moodle Link

- <http://oui>

Videos

- <http://incorporated into the different lectures>