

# Online Course Catalogue

<u>Course Title</u>	<u>Study Field</u>	<u>University</u>
<b>Fundamentals of Biofabrication</b>	<b>Engineering, manufacturing and construction</b>	<b>Utrecht University</b>

**CHARM priority field  
Technology and STEM;**

Course code

**BMB502816**

Faculty

**Faculty of Medicine**

Department

**Department of Orthopaedics**

Study Level:

**MA/MSc**

Number of credit points:

**3 ECTS**

Name of instructor(s):

**Paulina Nunez Bernal**

## Short description of the course

Biofabrication combines advanced 3D fabrication techniques with biological systems to create complex tissue constructs, which can be applied for tissue engineering, as 3D in vitro biological models, or as medical therapeutic products. This online course aims to provide the student with the fundamental knowledge on the various aspects of biofabrication, including 3D printing techniques, biomaterials, tissue engineering, applications, translation and ethics.

## Full description of the course

[https://osiris.uu.nl/osiris\\_student\\_uuprd/OnderwijsCatalogusSelect.do?selectie=cursus&cursus=BMB502816&collegejaar=2018&taal=en](https://osiris.uu.nl/osiris_student_uuprd/OnderwijsCatalogusSelect.do?selectie=cursus&cursus=BMB502816&collegejaar=2018&taal=en)

## Learning outcomes

Understand and apply knowledge of biofabrication, encompassing 3D printing techniques, biomaterial science, and tissue engineering: Able to describe different 3D printing techniques and biomaterials used in biofabrication, as well as different applications Able to process medical imaging data into printable CAD models Able to describe the role of (stem) cells in the development of specialised tissues and appreciate the rationale for regenerative medicine strategies Able to describe the cell-matrix interactions and the mechanical properties of specialised tissues Able to describe the interaction of implanted cells and biomaterials in living organisms Able to describe and distinguish different in vitro, in vivo and ex vivo research models and techniques, and determine which models/techniques are appropriate for answering a specific research/clinical question Able to describe techniques for the in vitro manipulation of cells and biomaterials to engineer tissues for regenerative medicine purposes or in vitro models Able to describe which challenges and approaches dominate the frontier research in biofabrication and/or

regeneration of various tissues Able to discuss ethical aspects of tissue engineering Critically evaluate scientific literature Function effectively in multidisciplinary, international (study) groups

## Additional information

Course requirements

**Motivation letter detailing reasons for participating in the course + interest in the subject area of biofabrication**

Language of instruction

**English**

Start date of course:

**11/18/2024**

End date of course:

**1/31/2025**

Contact hours per week for the student:

**10**

Specific regular weekly teaching day/time

**None, students follow weekly content at their own pace, but are required to log in a couple times per week to interact with peers and content experts**

Time zone

**CET (Spain, France, Germany, Netherlands, Hungary, Norway)**

Mode of delivery:

**fully online (all students participating online), no specific time (=asynchronous)**

Planned educational activities and teaching methods

**Recorded lectures, reading exercises, quizzes, group and individual assignments**

Learning Management System

**ULearning/Brightspace (piloting new online environment for UU courses)**

Assessment methods

**40% written assignment, 40% participation, 20% individual weekly assignments**

Certification

**Transcript of records**

Course literature (compulsory or recommended):

**Recommended literature list provided at the start of the course**

Number of places available for CHARM students

**Up to 5 for the first edition**

## Other relevant information

None

**CHARM-EU**