

## MBG 509 Microphysiological Systems SYLLABUS

“A microphysiological system (MPS) is an interconnected set of two- or three-dimensional cellular constructs that are frequently referred to as organs-on-chips or in vitro organ constructs.” Wikswa 2014

“An organ-on-a-chip (OOC) is a multi-channel 3-D microfluidic cell culture chip that simulates the activities, mechanics and physiological response of entire organs and organ systems, a type of artificial organ. It constitutes the subject matter of significant biomedical engineering research, more precisely in bio-MEMS. The convergence of labs-on-chips (LOCs) and cell biology has permitted the study of human physiology in an organ-specific context, introducing a novel model of *in vitro* multicellular human organisms. One day, they will perhaps abolish the need for animals in drug development and toxin testing.” *Wikipedia*

The course is based on published scientific papers on OOC.

### Resources:

Google Drive

[https://drive.google.com/drive/folders/1IL5QaI3SSs7-o7oft2oGfmtaTjJ\\_GV2X?usp=sharing](https://drive.google.com/drive/folders/1IL5QaI3SSs7-o7oft2oGfmtaTjJ_GV2X?usp=sharing)

The instructor will deliver a class on the basics of OOC and a class on how to present a scientific paper.

### Course Assignments:

**1/3 Scientific paper presentations:** Students are expected to present scientific articles in the field of OOC.

*Unless the instructor assigns the scientific paper, search for and decide on an article to work on. Confirm article with instructor before proceeding. Determine article one week before due date.*

*Create a folder with your name on Google Drive and upload the article including all supplementary data.*

Depending on the number of students enrolled, expect to present at least twice during the course.

Prepare your presentation answering the following questions:

Authors, affiliations, year, citations (5 points each)	20
Why did you choose that article? What is the significance of the article?	10
What is the scientific question of the article?	10
What methods are used?	10
What are the results?	20
Do you agree with the results? What are the strengths and weaknesses of the article?	20
Make sure to provide any background information necessary to understand the paper such as the biological topic or physical approach or previous/ related scientific papers or supplementary data.	10

### **2/3 Asking questions during scientific paper presentations:**

Each student is expected to ask at least one question during each presentation.

### **3/3 Scientific Project Proposal:**

Write and submit a TUBITAK 1001 grant within the scope of this course (in English).

### Course Policies:

Grading:	Scientific paper presentations	30 %
	Asking questions during scientific paper presentations	30 %
	Scientific Project Proposal	40 %

Attendance is a vital part of this course.

“İYTE Yüksek Öğretim Kurumları Öğrenci Disiplin Yönetmeliği” is to be followed.