

Academic Year/course: 2022/23

## 69711 - Cell Mechanobiology

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 69711 - Cell Mechanobiology

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 633 - Master's Degree in Biomedical Engineering

**ECTS:** 3.0

**Year:**

**Semester:** Second semester

**Subject Type:** Optional

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The learning process will be developed at various levels: lectures in which student participation will be encouraged, practical computer classes, activities and practical application or research work. The proposed methodology aims to encourage the student's continuous work.

#### 4.2. Learning tasks

The learning process designed for this subject is based on the following:

**A01 Participative lecture** (20 hours). Presentation by the lecturer of the main contents of the subject. It is usual to invite experts in specific experimental techniques.

**A03 Laboratory practicals** (6 hours). Several computer practicals will be carried out. For the development of the practices there will be scripts that the student will have to read before the practice, with a series of activities to be carried out during them. Subsequently, at the end of the practicals, a duly completed questionnaire must be handed in.

**A05 Practical application or research work.** At the beginning of the course, the work or works to be carried out will be explained. They will be works oriented to the application of the theoretical knowledge presented in the course.

**A06 Tutoring.** Timetable of personalised attention to the student with the aim of reviewing and discussing the materials and topics presented in the theoretical and practical classes.

**A08 Assessment.** Set of theoretical and practical written tests and presentation of reports or work used in the evaluation of the student's progress. Details can be found in the section corresponding to assessment activities.

#### 4.3. Syllabus

Lecture 1. Fundamental concepts of cell mechanics  
Lecture 2. Introduction to statistical mechanics  
Lecture 3. Experiments in cell mechanics  
Lecture 4. Mechanics of the cytoskeleton  
Lecture 5. Mechanics of the cellular membrane  
Lecture 6. Cell adhesion and cell contraction  
Lecture 7. Individual migration

Lecture 8. Collective migration  
Lecture 9. Cellular mechanotransduction

#### **4.4. Course planning and calendar**

Calendar of classroom sessions and presentation of work

The timetable for the subject, both classroom sessions and laboratory sessions, will be determined by the academic calendar established by the centre for the corresponding academic year. The timetable for the presentation of assignments will be announced at the beginning of the course.

The course is taught in the second spring term. The main activities planned include the presentation of theoretical content, the posing and solving of problems, practical work in the computer room and tutored practical work related to the content of the subject.

The start and end dates of the theory and problem classes, as well as the dates for the laboratory practicals and the global assessment tests will be set by the ÉINA and published on the Master's website (<http://www.masterib.es>). The dates for the delivery and monitoring of the tutored practical work will be announced sufficiently in advance in class and on the course website in the teaching digital system: <https://moodle.unizar.es/>.

#### **4.5. Bibliography and recommended resources**

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?id=6665>