

BIO-244

**Physical biology II**

Persat Alexandre

<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Life Sciences Engineering	BA6	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Courses	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

Living organisms are constantly subject to the action of mechanical forces. In this course, we will use a quantitative approach to describe how living systems generate, sense and respond to mechanical forces at the level of proteins, single cells and multicellular structures.

**Content**

Numbers and estimates in biology  
 Biopolymers and the cytoskeleton  
 Membrane mechanics  
 Mechanotransduction  
 Cellular morphology  
 Force generation and motility

**Keywords**

xxx

**Learning Prerequisites****Required courses**

xxx

**Recommended courses**

xxx

**Important concepts to start the course**

Fluid mechanics, structural mechanics and calculus

**Learning Outcomes**

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

- Quantify forces in biological systems
- Identify mechanically sensitive elements in a cell
- Integrate their engineer knowledge into living systems

**Teaching methods**

xxx

### Expected student activities

xxx

### Assessment methods

Written exam

### Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

### Resources

#### Bibliography

Physical Biology of the Cell (Rob Phillips, Jane Kondev, Julie Theriot)

#### Ressources en bibliothèque

- [Physical Biology of the Cell / Phillips](#)

#### Notes/Handbook

The instructors will provide class notes