BIO-244 **Physics of the cell**

Persat Alexandre

Cursus	Sem.	Type
Life Sciences Engineering	BA6	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Living organisms evolve in a physical world: their cells respond to mechanics, electricity and light. In this course, we will describe the behavior and function of cells using physical principles.

Content

Molecular motors
Ion channels
Electricity in cells
Multicellularity and biological patterns
Biofilms
Numbers and estimates in biology
Life at low Reynolds number
Biopolymers
Cytoskeleton
Membrane mechanics

Keywords

Biological Physics
Quantitative Biology
Back of the enveloppe calculations
Biomechanics
Mechanobiology
Cells

Learning Prerequisites

Required courses

Introductory Biology
Introductory Physics

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 in biology

Assessment methods

During the semester

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