

PHYS-468

Physics of life

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Cursus	Sem.	Type
Ing.-phys	MA2, MA4	Opt.
Physicien	MA2, MA4	Opt.

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

Summary

Life has emerged on our planet from physical principles such as molecular self-organization, thermodynamics, stochastics and iterative refinement. This course will introduce the physical methods to study life and will discuss the quantitative and physical concepts that make life possible.

Learning Prerequisites**Recommended courses**

- Biophysics: physics of the cell (P. De Los Rios, S. Manley, BA6)
- Biophysics: physics of biological systems (S. Rahi, MA1)

Important concepts to start the course

- Thermodynamics, Fourier transformation

Learning Outcomes

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

- Describe the molecules and structural arrangement of modern biological cells
- Describe and quantitatively understand the physical mechanisms that drive living organisms.
- Explain the biophysical tools used to study the molecules of life and interpret their data.

Teaching methods

- 2 hours of class + 2 hour of exercises
- Part of the class will be given via MOOC videos.

Assessment methods

- The course grading is composed of a final written exam counting for 100% of the grade.

- Homework will be given every week. Solutions will be handed out. Homework will not be graded. It is strongly advised to make the effort to do the homework weekly.

Resources

Bibliography

- David Sheehan: *Physical Biochemistry, Principles and Applications* (Wiley, 2013)