

PHYS-441

Statistical physics of biomacromolecules

De Los Rios Paolo

Cursus	Sem.	Type
Bioengineering	MA3	Opt.
Ing.-phys	MA1, MA3	Opt.
Life Sciences Engineering	MA1, MA3	Opt.
Physicien	MA1, MA3	Opt.
Sciences du vivant	MA3	Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	Oral
Workload	120h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Introduction to the application of the notions and methods of theoretical physics to problems in biology.

Content

1. Introduction to polymer theory: on and off-lattice polymers; statistical properties; exact, numerical and approximate results; correlation length; self-avoidance.

2. Interacting polymers: experiments and models; analytical and numerical solutions of the models; phase diagram.

3. Proteins: their role in biology; basic components; experimental results; models; analytical and numerical results.

Learning Prerequisites**Recommended courses**

Course of Statistical Physics

Learning Outcomes

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

- Solve problems in polymers statistical physics

Transversal skills

- Assess one's own level of skill acquisition, and plan their on-going learning goals.

Teaching methods

Ex cathedra. Exercises in class

Assessment methods

oral