

**Información del Plan Docente**

<b>Academic Year</b>	2017/18
<b>Faculty / School</b>	100 - Facultad de Ciencias
<b>Degree</b>	447 - Degree in Physics
<b>ECTS</b>	5.0
<b>Year</b>	4
<b>Semester</b>	Second semester
<b>Subject Type</b>	Optional
<b>Module</b>	---

**1.General information****1.1.Introduction****1.2.Recommendations to take this course****1.3.Context and importance of this course in the degree****1.4.Activities and key dates****2.Learning goals****2.1.Learning goals****2.2.Importance of learning goals****3.Aims of the course and competences****3.1.Aims of the course****3.2.Competences****4.Assessment (1st and 2nd call)****4.1.Assessment tasks (description of tasks, marking system and assessment criteria)****5.Methodology, learning tasks, syllabus and resources****5.1.Methodological overview****5.2.Learning tasks****5.3.Syllabus**

0.- Physics and Biology. Historical introduction and motivation.

## 26949 - Biological Physics

- 1.- Molecular and cellular biology review. Biological molecules: DNA, RNA and proteins. Membranes
- 2.- Random walks and diffusion.
- 3.- Statistical physics in and out of equilibrium.
- 4.- Life at low Reynolds number.
- 5.- Properties of water.
- 6.- Physics of Biopolymers.
- 7.- Cooperative phenomena.
- 8.- Self-assembly and self-organization.
- 9.- Molecular motors.
- 10.- Physics of nervous system.
- 11.- Systems Biology.

### 5.4.Course planning and calendar

### 5.5.Bibliography and recommended resources

- BB Dill, Ken A.. Molecular driving forces : statistical thermodynamics in Chemistry and Biology / Ken A. Dill, Sarina Bromberg, with de asistance of Dirk Stiger on the electrostatics chapters New York; London : Garland Science, 2002
- BB Essential cell biology / Bruce Alberts ... [et al.] . - 3rd ed. New York : Garland Science, cop. 2010
- BB Nelson, Philip Charles. Biological physics : energy, information, life / Philip Nelson ; with the assistance of Marko Radosavljevic and Sarina Bromberg . - Update 1st ed., 2nd printing New York : W. H. Freeman, cop. 2008
- BB Nelson, Philip Charles. Física biológica : energía, información, vida / Philip Nelson ; con la colaboración de Marko Radosavljevic y Sarina Bromberg ; [versión española por David Jou Mirabent] Barcelona : Reverté, D.L. 2005
- BB Phillips, Rob. Physical biology of the cell / Rob Phillips, Jane Kondev, Julie Theriot ; illustrated by Nigel Orme ; with problems, solutions, and editorial assistance of Herman G. García . New York : Garland Science, cop. 2009
- BB Sneppen, Kim. Physics in molecular biology / Kim Sneppen, Giovanni Zocchi Cambridge : Cambridge University Press, 2005
- BC Hoffmann, Peter M.. Life's Ratchet: How Molecular Machines Extract Order from Chaos. Perseus Books Group. 2012
- BC Monod, Jacques. El azar y la necesidad : ensayo sobre la filosofía natural de la biología moderna / Jacques Monod . - 5a. ed. Barcelona : Tusquets, 1993
- BC Schrödinger, Erwin. &Acirc;¿Qué es la vida? / Erwin Schrödinger ; Traducción y notas de Ricardo Guerrero . - 7ª ed. Barcelona : Tusquets, 2008
- BC Stewart, Ian. Las matemáticas de la vida. Critica. 2011