

Course Package

Soft and Biological Physics – 1A

Name module	Soft and Biological Physics – 1A
Educational programme	BSc Applied Physics
Period	First block of the first semester (Quarter 1A)
Study load	15 ECTS

Soft and Biological Physics			
block 1A	block 1B	block 2A	block 2B
Soft and Biological Matter (5 EC)			
Soft and Biological Techniques (5 EC)			
Colloids and Interfaces (5 EC)			

Required preliminary knowledge: -

Click [here](#) to view the course description of this module in our course catalogue. Please fill out the code '[201700186](#)' in the field 'Course Module/name'.

Academic year	2017
Course module/name	201700186
	<input type="checkbox"/> Also search in description
Show	<input checked="" type="radio"/> All course modules <input type="radio"/> Course modules for which you can register <input type="radio"/> Tests for which you can register
Starting block	No preference
Course type	No preference
Faculty	No preference
Organising study	No preference
Lecturer	
Participating study	No preference
Language of instruction	No preference

Please note: for the second block of the first semester (1B), check the modules taught by the study programme [Biomedical Technology](#) (M10 BMT, 1B Imaging and Diagnostics.)

These packages are not fixed. They serve as an example of what you are able to select. It may be possible for you to make changes if you would like to do so.

The modules are tentative and subject to change. Please check [the website](#) regularly.

Course description

Soft and Biological Physics contains 3 parts: Soft and Biological Matter (SBM), Advanced Colloids and Interfaces (ACI) and Soft and Biological Techniques (SBT).

SBM is a theory course that covers all aspects of physical systems that are governed by potentials close to thermal energy. Traditionally, this includes polymers, colloids, and liquid crystals. More recently, certain granular flows joined the club. Today it also includes soft and squidgy things that ooze. You will learn how bacteria swim, how to sequence DNA, and even how pinching your arm leads to a neural response (“ouch”). You will consider the manipulation of wet, ionic things (e.g., colloids, HIV in blood, molecular motors, ion channels,...) with electric fields and electrodes. Electrodes = quantum mechanics & solid state physics; fields = electrodynamics; thermal energy = statistical physics; wet = fluid dynamics. This is ultimate physics at its best. You have never sat a module like this before and you will feel incomplete without it.

The ACI theory course covers a variety of chemical and physical interactions between materials, and studies their consequences for the behavior of colloidal particles (e.g. stable (dis) ordered suspension, or flocculation into aggregates) and the wetting of surfaces. Topics include Interfacial Tensions and Wetting, Van der Waals Interactions, Acid-Base Interactions, Colloidal Interactions and stability: electrostatic, DLVO, steric, polymer-induced interactions.

SBT is a practical course in which you will do experiments on topics that are treated in SBM and ACI.

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