

# Bachelor in Physics

At ULB, an emphasis is put on understanding the scientific method and students are well prepared for careers in both pure and applied research. Teaching follows the most recent research results.

During the three first years (BA), students receive the necessary basic education in mathematics (32%), physics (51%) and chemistry (6%). This is complemented by English (3%), computer science (5%) and some optional subjects (3%), aiming to either broaden the students' scientific culture or to increase their knowledge of English. An ability to take initiative is very important and will be exercised both when it comes to your individual work or to placement within a research team in the physics department, per your choice.

The various topics covered are:

- > Classical and 20<sup>th</sup> century physics
- > Quantum mechanics
- > Statistical and non-linear physics
- > Astronomy and astrophysics
- > Fundamental interactions and materials physics

## Bloc 1 | BA-PHYS

### Cours obligatoires

|           |   |
|-----------|---|
| MATH-F101 | <b>Calcul différentiel et intégral I</b>   Denis BONHEURE (Coordinator), Mélanie BERTELSON and Bruno PREMOSELLI<br>⌚ 15 credits [lecture: 90h, tutorial classes: 90h] 📅 first and second terms 🗨 French             |
| MATH-F121 | <b>Géométrie analytique et calcul matriciel</b>   Michele D'ADDERIO (Coordinator) and Joost VERCRUYSSSE<br>⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 French                                  |
| MATH-F122 | <b>Algèbre linéaire</b>   Michele D'ADDERIO (Coordinator), Samuel FIORINI and Joost VERCRUYSSSE<br>⌚ 10 credits [lecture: 54h, tutorial classes: 54h] 📅 first and second terms 🗨 French                             |
| PHYS-F110 | <b>Physique générale I et II</b>   Pascal VANLAER (Coordinator), Michele SFERRAZZA and Sophie VAN ECK<br>⌚ 20 credits [lecture: 96h, tutorial classes: 102h, practical work: 42h] 📅 first and second terms 🗨 French |

### Cours optionnels

*An alternative chosen from the two following*

#### Option Chimie

|                         |  |
|-------------------------|--|
| CHIM-F101<br>(optional) | <b>Chimie générale</b>   François RENIERS (Coordinator), Laurence RONGY and Thierry VISART DE BOCARME<br>⌚ 10 credits [lecture: 72h, tutorial classes: 36h, practical work: 12h, project: 24h] 📅 first and second terms 🗨 French |
|-------------------------|--|

or

















#### Option Astrophysique

|                         |   |
|-------------------------|---|
| CHIM-S101<br>(optional) | <b>Chimie générale</b>   Thierry VISART DE BOCARME (Coordinator) and Laurence RONGY<br>⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 academic year 🗨 French |
| PHYS-F105<br>(optional) | <b>La structure de l'univers</b>   Alain JORISSEN (Coordinator) and Rodrigo ALVAREZ<br>⌚ 5 credits [lecture: 48h] 📅 first term 🗨 French                           |

# Bachelor in Physics

## Bloc 2 | BA-PHYS

### Cours obligatoires

- INFO-F207 **Informatique** | Sébastien CLESSE (Coordinator)  
 5 credits [lecture: 24h, tutorial classes: 24h]  first term  French
- LANG-F201 **Anglais scientifique I** | Alexander CORNFORD (Coordinator)  
 5 credits [tutorial classes: 48h]  second term  English
- MATH-F201 **Calcul différentiel et intégral II** | Mélanie BERTELSON (Coordinator), Denis BONHEURE and Bruno PREMOSELLI  
 10 credits [lecture: 60h, tutorial classes: 60h]  first and second terms  French
- MATH-F204 **Mécanique analytique** | Frank FERRARI (Coordinator) and Glenn BARNICH  
 10 credits [lecture: 60h, tutorial classes: 60h]  first and second terms  French
- PHYS-F201 **Thermodynamique** | Nicolas CHAMEL (Coordinator)  
 5 credits [lecture: 36h, tutorial classes: 24h]  second term  French
- PHYS-F202 **Relativité, électromagnétisme et optique ondulatoire** | Petr TINIAKOV (Coordinator)  
 10 credits [lecture: 72h, tutorial classes: 48h]  first and second terms  French
- PHYS-F203 **Introduction à la mécanique quantique** | Laurens Vanderstraeten (Coordinator)  
 5 credits [lecture: 30h, tutorial classes: 30h]  second term  French
- PHYS-F210 **Laboratoires, statistique appliquée à la physique expérimentale et projet** | Ioana Codrina MARIS (Coordinator), Juan Antonio AGUILAR SANCHEZ, Stéphane CLEMMEN and Sébastien CLESSE  
 10 credits [lecture: 24h, tutorial classes: 24h, practical work: 72h, project: 72h]  first and second terms  French

# Bachelor in Physics

## Bloc 3 | BA-PHYS

### Cours obligatoires

- MATH-F314 **Mathématiques pour la physique** | Riccardo ARGURIO (Coordinator), Bernard KNAEPEN and Bruno PREMOSELLI  
 ⌚ 10 credits [lecture: 66h, tutorial classes: 54h] 📅 first term 🗨️ French
- PHYS-F302 **Mécanique quantique** | Frank FERRARI (Coordinator) and Sébastien CLESSE  
 ⌚ 10 credits [lecture: 66h, tutorial classes: 54h] 📅 first and second terms 🗨️ French
- PHYS-F303 **Physique statistique** | Bortolo Matteo MOGNETTI (Coordinator)  
 ⌚ 10 credits [lecture: 60h, tutorial classes: 60h] 📅 first and second terms 🗨️ French
- PHYS-F304 **Spectrophysique et Astrophysique** | Sophie VAN ECK (Coordinator) and Pierre-François COHEUR  
 ⌚ 5 credits [lecture: 44h, tutorial classes: 16h] 📅 second term 🗨️ French
- PHYS-F305 **Physique des particules et Physique Nucleaire** | Laurent FAVART (Coordinator) and Michele SFERRAZZA  
 ⌚ 5 credits [lecture: 42h, tutorial classes: 18h] 📅 first and second terms 🗨️ French
- PHYS-F308 **Soft Matter and Solid State Physics** | Patricia Maria LOSADA PEREZ (Coordinator) and Simone NAPOLITANO  
 ⌚ 5 credits [lecture: 40h, tutorial classes: 20h] 📅 first and second terms 🗨️ English
- PHYS-F311 **Laboratoires et Stage de recherche** | Simone NAPOLITANO (Coordinator), Juan Antonio AGUILAR SANCHEZ, Barbara CLERBAUX, Gilles DE LENTDECKER, Patricia Maria LOSADA PEREZ, Ioana Codrina MARIS and Simona TOSCANO  
 ⌚ 10 credits [practical work: 72h, field trips: 24h] 📅 second term 🗨️ French

### Cours optionnels

*One course chosen from the following*

- BIOL-F102 (optional) **Biologie générale** | Patrick MARDULYN (Coordinator) and Etienne MEYLAN  
 ⌚ 5 credits [lecture: 48h] 📅 second term 🗨️ French
- ENVI-F1001 (optional) **Sciences de la Terre, Environnement et Société** | Pierre REGNIER (Coordinator), Jean-Michel DECROLY and Frank PATTYN  
 ⌚ 5 credits [lecture: 48h] 📅 first and second terms 🗨️ French
- ETHI-F201 (optional) **Sciences, éthique, histoire et société** | Grégoire Wallenborn (Coordinator) and Eric MURAILLE  
 ⌚ 5 credits [lecture: 48h] 📅 second term 🗨️ French
- ETHI-F301 (optional) **Science et Société : analyse de controverses scientifiques** | Patrick MARDULYN (Coordinator) and Grégoire Wallenborn  
 ⌚ 5 credits [lecture: 24h, project: 70h] 📅 first term 🗨️ French
- LANG-F301 (optional) **Anglais scientifique II** | Hugh MURPHY (Coordinator) and Alexander CORNFORD  
 ⌚ 5 credits [tutorial classes: 48h] 📅 first term 🗨️ English
- PHYS-F105 (optional) **La structure de l'univers** | Alain JORISSEN (Coordinator) and Rodrigo ALVAREZ  
 ⌚ 5 credits [lecture: 48h] 📅 first term 🗨️ French
- PHYS-F314 (optional) **Electronique** | Gilles DE LENTDECKER (Coordinator), Juan Antonio AGUILAR SANCHEZ and Yifan YANG  
 ⌚ 5 credits [lecture: 24h, tutorial classes: 6h, practical work: 30h] 📅 first term 🗨️ French
- PHYS-F317 (optional) **How To Make (almost) Any Experiment Using Digital Fabrication** | Denis TERWAGNE (Coordinator)  
 ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 first term 🗨️ French

PHYS-H302  
(optional)

**Eléments d'optique physique** | Pascal KOCKAERT (Coordinator) and François LEO

🕒 5 credits [lecture: 24h, tutorial classes: 12h, practical work: 24h] 📅 second term 🗨️ French

TEMP-0000  
(optional)

**Cours extérieurs au programme**

🕒 5 credits 📅 academic year 🗨️ French

