## Cycle view of the study programme

| | | Bl | Or | Th | Pr | Au | Cr |
|---|---|---|---|---|---|---|---|
| **Core curriculum compulsory courses (B1 : 15Cr, B2 : 18Cr)** | | | | | | | |
| PHYS0974-1 | *Materials physics and biophysics* - Maryse HOEBEKE, Alejandro SILHANEK - Suppl : Bertrand DUPÉ | B1 | Q1 | 30 | - | - | **5** |
| PHYS0930-1 | *Atomic physics* - Thierry BASTIN, François DAMANET, Peter SCHLAGHECK | B1 | Q1 | 30 | - | - | **5** |
| PHYS0975-1 | *Introduction to soft matter and complex systems* - Nicolas VANDEWALLE | B1 | Q1 | 30 | - | - | **5** |
| SMEM0028-1 | *Final thesis* - COLLÉGIALITÉ | B2 | TA | - | - | - | **18** |
| **Common core courses (B1 : 45Cr, B2 : 12Cr)** | | | | | | | |
| **In agreement with the Jury, choose a subject among : (B1 : 45Cr, B2 : 12Cr)** | | | | | | | |
| **Basic course (B1 : 45Cr, B2 : 12Cr)** | | | | | | | |
| SSTG0016-1 | *Training sessions and personal work* (english language) - COLLÉGIALITÉ, ISLV | B1 | Q2 | 15 | 45 | - | **5** |
| PHYS0983-1 | *Seminars in advanced physics I* (english language)<br>- *Materials physics and biophysics* - COLLÉGIALITÉ<br>- *Atomic physics* - COLLÉGIALITÉ<br>- *Physics of soft matter and complex systems* - COLLÉGIALITÉ | B1 | TA<br>10<br>10<br>10 | <br>-<br>-<br>- | <br>-<br>-<br>- | | **4** |
| PHYS0984-1 | *Seminars in advanced physics II* (english language)<br>- *Materials physics and biophysics* - COLLÉGIALITÉ<br>- *Atomic physics* - COLLÉGIALITÉ<br>- *Physics of soft matter and complex systems* - COLLÉGIALITÉ<br>**Prerequisite :**<br>PHYS0983-1 - Séminaires de Physique avancée I | B2 | TA<br>10<br>10<br>10 | <br>-<br>-<br>- | <br>-<br>-<br>- | | **4** |
| Choose courses in agreement with the jury for a total of 44 credits from among: (B1 : 36Cr, B2 : 8Cr) | | | | | | | |
| **Atomic and nuclear** | | | | | | | |
| PHYS0932-1 | *Cold atoms and atomic clocks* - Thierry BASTIN<br>**Corequisite :**<br>PHYS0930-1 - Physique atomique | - | Q2 | 20 | 10 | - | **4** |
| PHYS2027-2 | *Ultracold atoms and Bose-Enstein condensates* - Peter SCHLAGHECK<br>**Corequisite :**<br>PHYS0930-1 - Physique atomique<br>PHYS3021-1 - Mécanique quantique avancée | - | Q2 | 25 | - | - | **4** |
| PHYS0235-2 | (pas organisé en 2026-2027) *Quantum optics* - John MARTIN<br>**Corequisite :**<br>PHYS0930-1 - Physique atomique<br>PHYS3021-1 - Mécanique quantique avancée | - | Q2 | 20 | 10 | - | **4** |
| PHYS0949-1 | *Atomic structures modelling* - Pascal QUINET<br>**Corequisite :**<br>PHYS0930-1 - Physique atomique | - | Q2 | 10 | 10 | - | **4** |
| PHYS0941-2 | *Theoretical physics : Nuclei and particles* - JeanRené CUDELL | - | Q1 | 30 | - | - | **4** |
| PHYS3021-1 | *Advanced quantum mechanics* - Thierry BASTIN, John MARTIN, Peter SCHLAGHECK | - | Q1 | 30 | - | - | **4** |
| PHYS0997-1 | *Quantum information and computation* (english language) - François DAMANET | - | Q1 | 30 | - | - | **4** |
| PHYS3136-1 | *Open quantum systems* (english language) - François DAMANET, John MARTIN - [10h Proj.]<br>**Corequisite :** | - | Q2 | 20 | - | [+] | **4** |

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| | PHYS3021-1 - Mécanique quantique avancée<br>PHYS0235-2 - Optique quantique | | | | | | |
| PHYS3138-1 | *Nuclear physics: energy and materials* - David STRIVAY - [1d Vis.] | - | Q2 | 25 | 4 | [+] | **4** |
| **Soft Materials / Statistical Physics** | | | | | | | |
| PHYS0969-1 | *Introduction to biophotonics* - Laurent DREESEN | - | Q2 | 20 | 10 | - | **4** |
| PHYS0939-2 | *Physics of non-linearities, chaos and fractals* - Nicolas VANDEWALLE<br>**Corequisite :**<br>PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes | - | Q2 | 15 | 15 | - | **4** |
| PHYS3020-1 | *Discrete element method and soft materials* - Eric OPSOMER - [15h Proj.] | - | Q2 | 20 | - | [+] | **4** |
| PHYS1987-1 | *Matière active* - Eric OPSOMER, Nicolas VANDEWALLE | - | Q2 | 30 | - | - | **4** |
| PHYS0948-1 | *Microgravity* - Nicolas VANDEWALLE - [3d FW]<br>**Corequisite :**<br>PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes | B2 | Q2 | 10 | 20 | [+] | **4** |
| **Materials / Solid State** | | | | | | | |
| PHYS3003-1 | *Physics of functional oxides* (english language) - Philippe GHOSEZ<br>**Corequisite :**<br>PHYS0974-1 - Physique des matériaux et biophysique | - | Q1 | 20 | 10 | - | **4** |
| PHYS3023-1 | *Physics of magnetic materials* (english language) - Eric BOUSQUET<br>**Corequisite :**<br>PHYS0974-1 - Physique des matériaux et biophysique | - | Q2 | 20 | 10 | - | **4** |
| PHYS0981-1 | *Quantum modelling of materials properties* (english language) - Philippe GHOSEZ<br>**Corequisite :**<br>PHYS0974-1 - Physique des matériaux et biophysique | - | Q1 | 20 | 10 | - | **4** |
| PHYS0987-1 | *Physics of materials for energy* (english language) - Ngoc Duy NGUYEN - [15h Proj.] | - | Q1 | 20 | - | [+] | **4** |
| PHYS0988-1 | *Intrinsic and induced topological properties of matter* (english language) - Bertrand DUPÉ | - | Q2 | 20 | 10 | - | **4** |
| **Quantum Physics and Relativity** | | | | | | | |
| PHYS2012-1 | *Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK | - | Q1 | 20 | 5 | - | **4** |
| SPAT0012-1 | *General relativity* (english language) - Guillaume MAHLER | - | Q1 | 30 | 10 | - | **4** |
| **Experimental Physics** | | | | | | | |
| PHYS0250-2 | *Experimental statistical physics* - Stéphane DORBOLO<br>**Corequisite :**<br>PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes | - | Q2 | 10 | 20 | - | **4** |
| PHYS3019-1 | *Techniques of experimental physics* - Geoffroy LUMAY | - | Q2 | 20 | 20 | - | **4** |
| PHYS0943-1 | *Spectroscopy of electronic paramagnetic resonance* - Maryse HOEBEKE<br>**Corequisite :**<br>PHYS0974-1 - Physique des matériaux et biophysique | - | Q2 | 15 | 15 | - | **4** |
| PHYS0968-1 | *Signal processing* - Alejandro SILHANEK - Suppl : Peter SCHLAGHECK | - | Q2 | 25 | 20 | - | **4** |
| PHYS3037-1 | *Nanofabrication : principles and techniques* (english language) - Ngoc Duy NGUYEN, Alejandro SILHANEK<br>**Corequisite :** | - | Q2 | 25 | 20 | - | **5** |

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| | PHYS0974-1 - Physique des matériaux et biophysique | | | | | | |
| PHYS0999-1 | *Digital creation in sciences* - Roland BILLEN, Valentin FISCHER, JeanChristophe MONBALIU, Eric PARMENTIER, Michel RIGO, Nicolas VANDEWALLE - [30h Proj.] | - | TA | 10 | - | [+] | **5** |
| **Optics and Imaging** | | | | | | | |
| PHYS0942-3 | *Ionising radiations and imaging* - Alain SERET | - | Q1 | 20 | 5 | - | **4** |
| PHYS0938-1 | *Physics and cultural heritage* - David STRIVAY | - | Q1 | 20 | 12 | - | **4** |
| PHYS0048-2 | *Coherent and incoherent optics* (english language)<br>- *Coherent optics and lasers applications* - Serge HABRAKEN<br>- *Laser physics* - Serge HABRAKEN | - | Q1<br>10<br>5 | <br>15<br>5 | <br>-<br>- | | **4** |
| PHYS0048-3 | *Coherent and incoherent optics, Instrumental optics I* (english language) - Serge HABRAKEN | - | Q1 | 20 | 15 | - | **4** |
| PHYS0128-1 | *Magnetic Resonance Imaging - the Basics* (english language) - Laurent LAMALLE - [3d FW] | - | Q2 | 15 | - | [+] | **2** |
| PHYS0125-3 | *Instrumental optics II* (english language) - Serge HABRAKEN<br>**Prerequisite :**<br>PHYS0048-3 - Coherent and incoherent optics | B2 | Q2 | 25 | 15 | - | **4** |
| **Applied physics** | | | | | | | |
| INFO0939-1 | *High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.] | - | Q1 | 30 | 15 | [+] | **5** |
| MECA0470-1 | *New methods in computational mechanics and physics* (english language) - Maarten ARNST, Eric BÉCHET, Ludovic NOELS - [40h Proj.] | - | Q2 | 20 | - | [+] | **5** |
| ELEN0062-1 | *Introduction to machine learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.] | - | Q1 | 30 | 5 | [+] | **6** |
| **Didactics** | | | | | | | |
| PHYS0979-1 | *Conceptual approach to basic physics* - Hervé CAPS, Maryse HOEBEKE | - | Q1 | 30 | - | - | **4** |
| AESS0241-1 | *Introduction to physics didactics* - Maryse HOEBEKE | - | Q1 | 20 | - | - | **4** |
| PHYS1988-1 | *Projet de médiation scientifique* - Hervé CAPS | - | Q1 | 10 | 20 | - | **4** |
| [...] | Up to 20 credits (or more, in agreement with the Jury) in the two blocks may also be chosen in another study field or institution | | | | | | |

**Course Medical Physics (B1 : 45Cr, B2 : 12Cr)**

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| PHYS0952-3 | *Imaging through ionising radiation* - Alain SERET<br>**Corequisite :**<br>PHYS0990-1 - Dosimétrie<br>PHYS0989-1 - Radiobiology | B1 | Q1 | 25 | 5 | - | **4** |
| PHYS0989-1 | *Radiobiology* (english language)<br>**Corequisite :**<br>PHYS0990-1 - Dosimétrie<br>PHYS0952-3 - Imagerie par radiations ionisantes | B1 | Q2 | 10 | - | - | **2** |
| PHYS0990-1 | *Dosimetry* - Véronique BAART, N...<br>**Corequisite :**<br>PHYS0989-1 - Radiobiology<br>PHYS0952-3 - Imagerie par radiations ionisantes | B1 | Q2 | 20 | - | - | **3** |
| RADI2001-1 | *Radioprotection: hygiene problems* - Nadia WITHOFS<br>**Corequisite :**<br>PHYS0990-1 - Dosimétrie<br>PHYS0989-1 - Radiobiology<br>RADP0141-1 - Radioprotection | B1 | Q1 | 15 | - | - | **2** |

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| | BIOL0007-1 - Biologie tissulaire<br>PHYS0952-3 - Imagerie par radiations ionisantes | | | | | | |
| BIOL0007-1 | *Tissue biology* - N... | B1 | Q1 | 15 | 25 | - | **4** |
| PHYL0644-1 | *Human Anatomy and Physiology* - Valérie DEFAWEUX | B1 | Q2 | 30 | - | - | **3** |
| ANAT0222-1 | *Elements of Radiology* - Luaba TSHIBANDA, Christophe VALKENBORGH | B1 | Q2 | 10 | 5 | - | **2** |
| CHIM0620-1 | *Radiopharmaceutical Chemistry* - Thibault GENDRON | B1 | Q1 | 20 | 10 | - | **3** |
| PHYS0128-1 | *Magnetic Resonance Imaging - the Basics* (english language) - Laurent LAMALLE - [3d FW]<br>**Corequisite :**<br>PHYS0930-1 - Physique atomique | B1 | Q2 | 15 | - | [+] | **2** |
| RADP0141-1 | *Radioprotection*<br>*- Part a) Radioprotection techniques and complements* - Véra PIRLET<br>*- Part b) Legislation on radioprotection and the organisation of a radiotherapy, radiodiagnostic and nuclear medicine department* - Véra PIRLET | B1 | Q2<br>30<br>10 | 15<br>- | -<br>- | | **6** |
| SSTG0041-1 | *Placement in medical radiophysics* - Véronique BAART, Claire BERNARD, Alain SERET - [12d Internship]<br>**Corequisite :**<br>PHYS0990-1 - Dosimétrie<br>PHYS0989-1 - Radiobiology<br>PHYS0952-3 - Imagerie par radiations ionisantes | B1 | Q2 | 2 | - | [+] | **7** |
| STAT0420-1 | *Biostatistics 2* - AnneFrançoise DONNEAU<br>**Corequisite :**<br>PHYS0128-1 - Magnetic Resonance Imaging - the Basics | B1 | Q1 | 15 | 15 | - | **3** |
| PHYS0968-1 | *Signal processing* - Alejandro SILHANEK - Suppl : Peter SCHLAGHECK | B1 | Q2 | 25 | 20 | - | **4** |
| QUAL0722-1 | *Safety and quality assurance* (english language) - Edmond STERPIN<br>**Prerequisite :**<br>SSTG0041-1 - Stages en radiophysique médicale | B2 | Q2 | 5 | 10 | - | **2** |
| RADL0442-1 | *Radiobiology and radiopathology elements* - Chantal HUMBLET<br>**Prerequisite :**<br>BIOL0007-1 - Biologie tissulaire<br>PHYL0644-1 - Anatomie et physiologie humaines<br>ANAT0222-1 - Eléments d'anatomie radiologique | B2 | Q1 | 40 | 20 | - | **6** |
| PHYS3139-1 | *Digital methods applied to medical physics*<br>*- Part A: 2D and 3D tomographical reconstruction* - Alain SERET<br>*- Part B: Transfer and coregistration of medical images* - Mohamed Ali BAHRI<br>**Prerequisite :**<br>PHYS0968-1 - Traitement du signal<br>PHYS0952-3 - Imagerie par radiations ionisantes | B2 | Q1<br>10<br>15 | <br>-<br>- | <br>-<br>- | | **2** |
| CHIM0621-2 | *Production and application of radioelements* - Thibault GENDRON - [3d FW] | B2 | Q2 | 15 | - | [+] | **2** |

**Only accessible to students enrolled in the Master's programme before the 2025-2026 academic year.**

**Focus compulsory courses (B2 : 30Cr)**

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| AESS1222-1 | *Special didactics in physics : course and exercises (1st part)* - Maryse HOEBEKE, PierreXavier MARIQUE<br>**Corequisite :**<br>PHYS0979-1 - Approche conceptuelle de la physique de base | B2 | Q1 | 40 | - | - | **3** |
| AESS1223-1 | *Special didactics in physics : placements (1st part)*<br>*- Observation placements* - Maryse HOEBEKE, PierreXavier MARIQUE - | B2 | Q1<br>- | <br>- | <br>[+] | | **3** |

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| | [10h Internship]<br>- *Teaching placements* - Maryse HOEBEKE, PierreXavier MARIQUE - [20h Internship]<br>- *Reflexive practical work* - Maryse HOEBEKE, PierreXavier MARIQUE<br>**Corequisite :**<br>PHYS0979-1 - Approche conceptuelle de la physique de base | | | - - -<br>- 5 -<br>- | [+]<br>- | | |
| AESS2222-1 | *Special didactics in physics : course and exercises (2nd part)* - Maryse HOEBEKE, PierreXavier MARIQUE | B2 | Q2 | 35 | - | - | **4** |
| AESS2223-1 | *Special didactics in physics : placements (2nd part)*<br>- *Teaching placements* - Maryse HOEBEKE, PierreXavier MARIQUE - [20h Internship]<br>- *Reflexive practical work* - Maryse HOEBEKE, PierreXavier MARIQUE<br>- *Extra-scholar teaching activities* - Maryse HOEBEKE, PierreXavier MARIQUE | B2 | Q2 | <br>- -<br>- -<br>- 10 | <br>[+]<br>-<br>- | | **5** |
| AESS0202-1 | *General didactics: course and exercises ; observation placements ; reflexive practices* - Margaux NOIZET - [10h Internship] | B2 | TA | 30 | 10 | [+] | **4** |
| AESS0246-1 | *Analysis of scholastic institutions and educational policies* | B2 | Q2 | 15 | - | - | **1** |
| AESS0004-1 | *Media education* | B2 | Q2 | 15 | - | - | **1** |
| AESS0248-1 | *Elements of sociology of education* - JeanFrançois GUILLAUME | B2 | Q2 | 10 | - | - | **1** |
| AESS0140-1 | *Professional ethics and training to neutrality and citizenship* - Anne HERLA | B2 | Q2 | 25 | - | - | **2** |
| AESS0143-1 | *Educational Psychology of adolescents and young adults* | B2 | Q1 | 15 | - | - | **2** |
| AESS0249-1 | *Interdisciplinary seminar* | B2 | Q2 | 15 | - | - | **1** |
| AESS0339-1 | *Understand and manage the diversity of public schools* | B2 | TA | 10 | 15 | - | **3** |

## Bridging courses (max 15-60 credits) Master in physics (120 credits)

**Optional courses (B0 : 60Cr)**

The update course, worth a maximum of 60 credits, will be determined based on students¿ prior training. (B0 : 60Cr)

[...] Between 15 and 60 ECTS of courses from "Bachelier en sciences physiques"