

Cycle view of the study programme

| | | B1 | Or | Th | Pr | Au | Cr |
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| Cours obligatoires de la finalité (B2 : 30Cr) | | | | | | | |
| PHYS0991-1 | <i>Special applications and techniques in radiotherapy</i> - Véronique BAART, Luca PELLEGRINI Prerequisite : PHYS0989-1 - Radiobiology PHYS0990-1 - Dosimétrie | B2 | Q1 | 35 | - | - | 4 |
| PHYS0992-1 | <i>Special applications and techniques in radiodiagnostic</i> (english language) - Hilde BOSMANS Prerequisite : PHYS0952-3 - Imagerie par radiations ionisantes PHYS0989-1 - Radiobiology | B2 | Q1 | 15 | - | - | 2 |
| PHYS0993-1 | <i>Special applications and techniques in nuclear medicine</i> - Claire BERNARD, Roland HUSTINX, Roland HUSTINX, Alain SERET Prerequisite : PHYS0952-3 - Imagerie par radiations ionisantes PHYS0989-1 - Radiobiology | B2 | Q1 | 20 | - | - | 3 |
| PHYS0994-1 | <i>Internal dosimetry of radiopharmaceutical compounds</i> - Claire BERNARD, Christophe MERCIER, Alain SERET Prerequisite : PHYS0952-3 - Imagerie par radiations ionisantes PHYS0989-1 - Radiobiology | B2 | Q1 | 8 | 4 | - | 2 |
| PHYS0995-1 | <i>Computerized dosimetry specialized in radiotherapy</i> (english language) - Edmond STERPIN Prerequisite : PHYS0989-1 - Radiobiology PHYS0990-1 - Dosimétrie | B2 | Q1 | 15 | - | - | 2 |
| PHYS0996-1 | <i>2D & 3D tomographical reconstruction</i> - Alain SERET Prerequisite : PHYS0968-1 - Traitement du signal PHYS0952-3 - Imagerie par radiations ionisantes | B2 | Q1 | 10 | - | - | 1 |
| SSTG0015-2 | <i>Training</i> - COLLÉGIALITÉ - [3mois Internship] Prerequisite : PHYS0952-3 - Imagerie par radiations ionisantes PHYS0989-1 - Radiobiology PHYS0990-1 - Dosimétrie Corequisite : PHYS0991-1 - Applications et techniques spéciales en radiothérapie PHYS0992-1 - Applications et techniques spéciales en radiodiagnostic PHYS0993-1 - Applications et techniques spéciales en médecine nucléaire PHYS0994-1 - Dosimétrie interne des composés radiopharmaceutiques PHYS0995-1 - Computerized dosimetry specialized in radiotherapy PHYS0996-1 - Reconstruction tomographique 2D & 3D | B2 | TA | - | - | [+] | 16 |

Cours obligatoires du tronc commun (B1 : 15Cr, B2 : 18Cr)

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|------------|---------------------------------------------------------------------------------|----|----|----|---|---|----|
| PHYS0974-1 | <i>Materials physics and biophysics</i> - Maryse HOEBEKE, Alejandro SILHANEK | B1 | Q1 | 30 | - | - | 5 |
| PHYS0930-1 | <i>Atomic physics</i> - Thierry BASTIN, Peter SCHLAGHECK | B1 | Q1 | 30 | - | - | 5 |
| PHYS0975-1 | <i>Introduction to soft matter and complex systems</i> - Nicolas VANDEWALLE | B1 | Q1 | 30 | - | - | 5 |
| SMEM0028-1 | <i>Final thesis</i> - COLLÉGIALITÉ | B2 | TA | - | - | - | 18 |

Cours au choix du tronc commun (B1 : 45Cr, B2 : 12Cr)

In agreement with the Jury, choose a subject among : (B1 : 45Cr, B2 : 12Cr)

Basic course (B1 : 45Cr, B2 : 12Cr)

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| SSTG0016-1 | <i>Training sessions and personal work</i> (english language) - COLLÉGIALITÉ, ISLV | B1 | Q2 | 15 | 45 | - | 5 |
| PHYS0983-1 | <i>Seminars in advanced physics I</i> (english language) - <i>Materials physics and biophysics</i> - COLLÉGIALITÉ - <i>Atomic physics</i> - COLLÉGIALITÉ - <i>Physics of soft matter and complex systems</i> - COLLÉGIALITÉ | B1 | TA | 10 | - | - | 4 |
| PHYS0984-1 | <i>Seminars in advanced physics II</i> (english language) - <i>Materials physics and biophysics</i> - COLLÉGIALITÉ - <i>Atomic physics</i> - COLLÉGIALITÉ - <i>Physics of soft matter and complex systems</i> - COLLÉGIALITÉ | B2 | TA | 10 | - | - | 4 |

Prerequisite :
PHYS0983-1 - Séminaires de Physique avancée I

Choose courses in agreement with the jury for a total of 44 credits from among: (B1 : 36Cr, B2 : 8Cr)

Atomic and nuclear

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| PHYS0932-1 | <i>Cold atoms and atomic clocks</i> - Thierry BASTIN Corequisite : PHYS0930-1 - Physique atomique | - | Q2 | 20 | 10 | - | 4 |
| PHYS2027-2 | <i>Ultracold atoms and Bose-Einstein condensates</i> - Peter SCHLAGHECK Corequisite : PHYS0930-1 - Physique atomique PHYS3021-1 - Mécanique quantique avancée | - | Q2 | 25 | - | - | 4 |
| PHYS0235-2 | <i>Quantum optics</i> - John MARTIN Corequisite : PHYS0930-1 - Physique atomique PHYS3021-1 - Mécanique quantique avancée | - | Q2 | 20 | 10 | - | 4 |
| PHYS0949-1 | <i>Atomic structures modelling</i> - Pascal QUINET Corequisite : PHYS0930-1 - Physique atomique | - | Q2 | 10 | 10 | - | 4 |
| PHYS0941-2 | <i>Theoretical physics : Nuclei and particles</i> - JeanRené CUDELL | - | Q1 | 30 | - | - | 4 |
| PHYS3021-1 | <i>Advanced quantum mechanics</i> - Thierry BASTIN, John MARTIN, Peter SCHLAGHECK | - | Q1 | 30 | - | - | 4 |
| PHYS0997-1 | <i>Quantum information and computation</i> (english language) - François DAMANET | - | Q1 | 30 | - | - | 4 |
| PHYS3136-1 | <i>Open quantum systems</i> (english language) - François DAMANET, John MARTIN - [10h Proj.] Corequisite : PHYS3021-1 - Mécanique quantique avancée PHYS0235-2 - Optique quantique | - | Q2 | 20 | - | [+] | 4 |

Soft Materials / Statistical Physics

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| PHYS0969-1 | <i>Introduction to biophotonics</i> - Laurent DREESEN | - | Q2 | 20 | 10 | - | 4 |
| PHYS0939-2 | <i>Physics of non-linearities, chaos and fractals</i> - Nicolas VANDEWALLE Corequisite : PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes | - | Q2 | 15 | 15 | - | 4 |
| PHYS3020-1 | <i>Discrete element method and soft materials</i> - Eric OPSOMER - [15h Proj.] | - | Q2 | 20 | - | [+] | 4 |
| PHYS0948-1 | <i>Microgravity</i> - Martial NOIRHOMME, Nicolas VANDEWALLE - [3d FW] Corequisite : PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes | B2 | Q2 | 10 | 20 | [+] | 4 |

Materials / Solid State

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| PHYS3003-1 | <i>Physics of functional oxides</i> (english language) - Philippe GHOSEZ Corequisite : PHYS0974-1 - Physique des matériaux et biophysique | - | Q1 | 20 | 10 | - | 4 |
| PHYS3004-1 | <i>Physics of nanomaterials</i> (english language) - JeanYves RATY Corequisite : PHYS0974-1 - Physique des matériaux et biophysique | - | Q2 | 20 | 10 | - | 4 |
| PHYS3023-1 | <i>Physics of magnetic materials</i> (english language) - Eric BOUSQUET Corequisite : PHYS0974-1 - Physique des matériaux et biophysique | - | Q2 | 20 | 10 | - | 4 |
| PHYS0981-1 | <i>Quantum modelling of materials properties</i> (english language) - Philippe GHOSEZ Corequisite : PHYS0974-1 - Physique des matériaux et biophysique | - | Q1 | 20 | 10 | - | 4 |
| CHIM0202-2 | <i>Physical Chemistry</i> - Christian DAMBLON, Bernard LEYH | - | Q2 | 30 | - | - | 4 |
| PHYS0987-1 | <i>Physics of materials for energy</i> (english language) - Ngoc Duy NGUYEN - [15h Proj.] | - | Q1 | 20 | - | [+] | 4 |
| PHYS0988-1 | <i>Intrinsic and induced topological properties of matter</i> (english language) - Bertrand DUPÉ | - | Q2 | 20 | 10 | - | 4 |
| Quantum Physics and Relativity | | | | | | | |
| PHYS2012-1 | <i>Relativistic quantum mechanics and relativistic statistics</i> - Peter SCHLAGHECK | - | Q1 | 20 | 5 | - | 4 |
| SPAT0012-1 | <i>General relativity</i> (english language) - Guillaume MAHLER | - | Q1 | 30 | 10 | - | 4 |
| Experimental Physics | | | | | | | |
| PHYS0250-2 | <i>Experimental statistical physics</i> - Stéphane DORBOLO Corequisite : PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes | - | Q2 | 10 | 20 | - | 4 |
| PHYS3019-1 | <i>Techniques of experimental physics</i> - Geoffroy LUMAY | - | Q2 | 20 | 20 | - | 4 |
| PHYS0943-1 | <i>Spectroscopy of electronic paramagnetic resonance</i> - Maryse HOEBEKE Corequisite : PHYS0974-1 - Physique des matériaux et biophysique | - | Q2 | 15 | 15 | - | 4 |
| PHYS0095-1 | <i>The physics of accelerators and vacuum technologies</i> - David STRIVAY | - | Q2 | 10 | 10 | - | 4 |
| PHYS0968-1 | <i>Signal processing</i> - Alejandro SILHANEK | - | Q2 | 25 | 20 | - | 4 |
| PHYS3037-1 | <i>Nanofabrication : principles and techniques</i> (english language) - Ngoc Duy NGUYEN, Alejandro SILHANEK Corequisite : PHYS0974-1 - Physique des matériaux et biophysique | - | Q2 | 25 | 15 | - | 4 |
| PHYS0999-1 | <i>Digital creation in sciences</i> - Roland BILLEN, Valentin FISCHER, Pierre MATHONET, JeanChristophe MONBALIU, Eric PARMENTIER, Nicolas VANDEWALLE - [30h Proj.] | - | TA | 10 | - | [+] | 5 |
| Optics and Imaging | | | | | | | |
| PHYS0942-3 | <i>Ionising radiations and imaging</i> - Alain SERET | - | Q1 | 20 | 5 | - | 4 |
| PHYS0938-1 | <i>Physics and cultural heritage</i> - David STRIVAY | - | Q1 | 15 | 5 | - | 4 |
| PHYS0048-2 | <i>Coherent and incoherent optics</i> (english language) - <i>Coherent optics and lasers applications</i> - Serge HABRAKEN - <i>Laser physics</i> - Serge HABRAKEN | - | Q1 | 10 | 15 | - | 4 |
| PHYS0048-3 | <i>Coherent and incoherent optics, Instrumental optics I</i> (english language) - Serge HABRAKEN | - | Q1 | 20 | 15 | - | 4 |

PHYS0128-1 *Magnetic Resonance Imaging - the Basics* (english language) - Laurent LAMALLE - [3d FW] - Q1 15 - [+] 2

PHYS0125-3 *Instrumental optics II* (english language) - Serge HABRAKEN B2 Q2 25 15 - 4
Prerequisite :
 PHYS0048-3 - Coherent and incoherent optics

Applied physics

INFO0939-1 *High performance scientific computing* (english language) - Christophe GEUZAINÉ - [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

[...] 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)

PHYS0952-3 *Imaging through ionising radiation* - Alain SERET B1 Q1 25 5 - 4
Corequisite :
 PHYS0990-1 - Dosimétrie
 PHYS0989-1 - Radiobiology

PHYS0989-1 *Radiobiology* (english language) - N... B1 Q2 10 - - 2
Corequisite :
 PHYS0990-1 - Dosimétrie
 PHYS0952-3 - Imagerie par radiations ionisantes

PHYS0990-1 *Dosimetry* - Véronique BAART, Luca PELLEGRINI B1 Q2 20 - - 3
Corequisite :
 PHYS0989-1 - Radiobiology
 PHYS0952-3 - Imagerie par radiations ionisantes

RADI2001-1 *Radioprotection: hygiene problems* B1 Q1 15 - - 2
Corequisite :
 PHYS0990-1 - Dosimétrie
 PHYS0989-1 - Radiobiology
 RADP0141-1 - Radioprotection
 BIOL0007-1 - Biologie tissulaire
 PHYS0952-3 - Imagerie par radiations ionisantes

BIOL0007-1 *Tissue biology* - Marc THIRY B1 Q1 15 25 - 4

PHYL0644-1 *Human Anatomy and Physiology* B1 Q2 30 - - 3

ANAT0222-1 *Elements of Radiology* - Paul MEUNIER, Luaba TSHIBANDA, Christophe VALKENBORGH B1 Q1 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] B1 Q1 15 - [+] 2
Corequisite :
 PHYS0930-1 - Physique atomique

RADP0141-1 *Radioprotection - Part a) Radioprotection techniques and complements* - B1 Q2 30 15 - 6

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| | IRLET - Part b) Legislation on radioprotection and the organisation of a radiotherapy, radiodiagnostic and nuclear medicine department - Véra PIRLET | | 10 | - | - | | |
| SSTG0041-1 | Placement in medical radiophysics - Véronique BAART, Claire BERNARD, Alain SERET - [12d Internship] Corequisite : PHYS0990-1 - Dosimétrie PHYS0989-1 - Radiobiology PHYS0952-3 - Imagerie par radiations ionisantes | B1 Q2 | 2 | - | [+] | 7 | |
| STAT0420-1 | Biostatistics 2 - AnneFrançoise DONNEAU | B1 Q1 | 15 | 15 | - | 3 | |
| PHYS0968-1 | Signal processing - Alejandro SILHANEK | B1 Q2 | 25 | 20 | - | 4 | |
| QUAL0722-1 | Safety and quality assurance (english language) - Edmond STERPIN Prerequisite : SSTG0041-1 - Stages en radiophysique médicale | B2 Q2 | 5 | 10 | - | 2 | |
| RADL0442-1 | Radiobiology and radiopathology elements - Chantal HUMBLET, Philippe MARTINIVE Prerequisite : BIOL0007-1 - Biologie tissulaire PHYL0644-1 - Anatomie et physiologie humaines ANAT0222-1 - Eléments d'anatomie radiologique | B2 Q1 | 40 | 20 | - | 6 | |
| PHYS2024-1 | Transfer and co-registration of medical images - Mohamed Ali BAHRI | B2 Q1 | 15 | - | - | 2 | |
| CHIM0621-2 | Production and application of radioelements - Thibault GENDRON - [3d FW] | B2 Q2 | 15 | - | [+] | 2 | |

Additional ECTS (max 15-60) Master in physics (120 ECTS)

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"