

## Cycle view of the study programme

B1 Or Th Pr Au Cr

### Focus compulsory courses (B2 : 14Cr)

STRA0030-1 *Final thesis complement* - COLLÉGIALITÉ B2 TA - - - 14

### Focus optional courses (B2 : 16Cr)

[...] With the jury's agreement, choose from the Uliège programme complementary courses which have not already been chosen for a total of 16 credits, with a maximum of 20 credits outside the course over the two blocks.

### Core curriculum compulsory courses (B1 : 15Cr, B2 : 18Cr)

PHYS0974-1 *Materials physics and biophysics* - Maryse HOEBEKE, Alejandro SILHANEK B1 Q1 30 - - 5  
PHYS0930-1 *Atomic physics* - Thierry BASTIN, 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)*  
- *Materials physics and biophysics* - COLLÉGIALITÉ B1 TA 10 - - 4  
- *Atomic physics* - COLLÉGIALITÉ 10 - -  
- *Physics of soft matter and complex systems* - COLLÉGIALITÉ 10 - -  
PHYS0984-1 *Seminars in advanced physics II (english language)*  
- *Materials physics and biophysics* - COLLÉGIALITÉ B2 TA 10 - - 4  
- *Atomic physics* - COLLÉGIALITÉ 10 - -  
- *Physics of soft matter and complex systems* - COLLÉGIALITÉ 10 - -  
**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

PHYS0932-1 *Cold atoms and atomic clocks* - Thierry BASTIN - Q2 20 10 - 4  
**Corequisite :**  
PHYS0930-1 - Physique atomique  
PHYS2027-2 *Ultracold atoms and Bose-Einstein condensates* - Peter SCHLAGHECK - Q2 25 - - 4  
**Corequisite :**  
PHYS0930-1 - Physique atomique  
PHYS3021-1 - Mécanique quantique avancée  
PHYS0235-2 *Quantum optics* - John MARTIN - Q2 20 10 - 4  
**Corequisite :**  
PHYS0930-1 - Physique atomique  
PHYS3021-1 - Mécanique quantique avancée  
PHYS0949-1 *Atomic structures modelling* - Pascal QUINET - Q2 10 10 - 4  
**Corequisite :**  
PHYS0930-1 - Physique atomique  
PHYS0941-2 *Theoretical physics : Nuclei and particles* - JeanRené CUDELL - Q1 30 - - 4  
PHYS3021-1 *Advanced quantum mechanics* - Thierry BASTIN, John MARTIN, - Q1 30 - - 4

Peter SCHLAGHECK

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.] <b>Corequisite :</b> PHYS3021-1 - Mécanique quantique avancée PHYS0235-2 - Optique quantique	-	Q2	20	-	[+]	4

#### Soft Materials / Statistical Physics

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 <b>Corequisite :</b> 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] <b>Corequisite :</b> PHYS0975-1 - Introduction à la matière molle et aux systèmes complexes	B2	Q2	10	20	[+]	4

#### Materials / Solid State

PHYS3003-1	<i>Physics of functional oxides</i> (english language) - Philippe GHOSEZ <b>Corequisite :</b> PHYS0974-1 - Physique des matériaux et biophysique	-	Q1	20	10	-	4
PHYS3004-1	<i>Physics of nanomaterials</i> (english language) - JeanYves RATY <b>Corequisite :</b> PHYS0974-1 - Physique des matériaux et biophysique	-	Q2	20	10	-	4
PHYS3023-1	<i>Physics of magnetic materials</i> (english language) - Eric BOUSQUET <b>Corequisite :</b> PHYS0974-1 - Physique des matériaux et biophysique	-	Q2	20	10	-	4
PHYS0981-1	<i>Quantum modelling of materials properties</i> (english language) - Philippe GHOSEZ <b>Corequisite :</b> 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 <b>Corequisite :</b> 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> -	-	Q2	15	15	-	4

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**Corequisite :**

PHYS0974-1 - Physique des matériaux et biophysique

PHYS0095-1 *The physics of accelerators and vacuum technologies* - David STRIVAY - Q2 10 10 - 4

PHYS0968-1 *Signal processing* - Alejandro SILHANEK - Q2 25 20 - 4

PHYS3037-1 *Nanofabrication : principles and techniques* (english language) - Ngoc Duy NGUYEN, Alejandro SILHANEK - Q2 25 15 - 4

**Corequisite :**

PHYS0974-1 - Physique des matériaux et biophysique

PHYS0999-1 *Digital creation in sciences* - Roland BILLEN, Valentin FISCHER, Pierre MATHONET, JeanChristophe MONBALIU, Eric PARMENTIER, 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 15 5 - 4

PHYS0048-2 *Coherent and incoherent optics* (english language) - Serge HABRAKEN - Q1 10 15 - 4  
 - *Coherent optics and lasers applications* - Serge HABRAKEN 5 5 -  
 - *Laser physics* - Serge HABRAKEN

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] - 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 GEUZAIN - [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) - Olivier VAN HOEY B1 Q2 10 - - 2  
**Corequisite :**  
 PHYS0990-1 - Dosimétrie  
 PHYS0952-3 - Imagerie par radiations ionisantes

PHYS0990-1	<i>Dosimetry</i> - Véronique BAART, Luca PELLEGRINI <b>Corequisite :</b> PHYS0989-1 - Radiobiology PHYS0952-3 - Imagerie par radiations ionisantes	B1	Q2	20	-	-	3
RADI2001-1	<i>Radioprotection: hygiene problems</i> - Nadia WITHOFS <b>Corequisite :</b> PHYS0990-1 - Dosimétrie PHYS0989-1 - Radiobiology RADP0141-1 - Radioprotection BIOL0007-1 - Biologie tissulaire PHYS0952-3 - Imagerie par radiations ionisantes	B1	Q1	15	-	-	2
BIOL0007-1	<i>Tissue biology</i> - Marc THIRY	B1	Q1	15	25	-	4
PHYL0644-1	<i>Human Anatomy and Physiology</i> - Valérie DEFAWEUX	B1	Q2	30	-	-	3
ANAT0222-1	<i>Elements of Radiology</i> - Paul MEUNIER, Luaba TSHIBANDA, Christophe VALKENBORGH	B1	Q1	10	5	-	2
CHIM0620-1	<i>Radiopharmaceutical Chemistry</i> - Thibault GENDRON	B1	Q1	20	10	-	3
PHYS0128-1	<i>Magnetic Resonance Imaging - the Basics</i> (english language) - Laurent LAMALLE - [3d FW] <b>Corequisite :</b> PHYS0930-1 - Physique atomique	B1	Q1	15	-	[+]	2
RADP0141-1	<i>Radioprotection</i> - Part a) <i>Radioprotection techniques and complements</i> - Véra PIRLET - Part b) <i>Legislation on radioprotection and the organisation of a radiotherapy, radiodiagnostic and nuclear medicine department</i> - Véra PIRLET	B1	Q2	30	15	-	6
SSTG0041-1	<i>Placement in medical radiophysics</i> - Véronique BAART, Claire BERNARD, Alain SERET - [12d Internship] <b>Corequisite :</b> PHYS0990-1 - Dosimétrie PHYS0989-1 - Radiobiology PHYS0952-3 - Imagerie par radiations ionisantes	B1	Q2	2	-	[+]	7
STAT0420-1	<i>Biostatistics 2</i> - AnneFrançoise DONNEAU	B1	Q1	15	15	-	3
PHYS0968-1	<i>Signal processing</i> - Alejandro SILHANEK	B1	Q2	25	20	-	4
QUAL0722-1	<i>Safety and quality assurance</i> (english language) - Edmond STERPIN <b>Prerequisite :</b> SSTG0041-1 - Stages en radiophysique médicale	B2	Q2	5	10	-	2
RADL0442-1	<i>Radiobiology and radiopathology elements</i> - Chantal HUMBLET <b>Prerequisite :</b> BIOL0007-1 - Biologie tissulaire PHYL0644-1 - Anatomie et physiologie humaines ANAT0222-1 - Eléments d'anatomie radiologique	B2	Q1	40	20	-	6
PHYS2024-1	<i>Transfer and co-registration of medical images</i> - Mohamed Ali BAHRI	B2	Q1	15	-	-	2
CHIM0621-2	<i>Production and application of radioelements</i> - Thibault GENDRON - [3d FW]	B2	Q2	15	-	[+]	2

## 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)

Study programmes 2024-2025  
Faculty of Sciences  
Master in physics, research focus

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