Université de Liège

Study programmes 2015-2016

Faculty of Sciences

Master in physics (120 ECTS)

Cycle view of the study programme

		Bl	Or	Th	Pr	Au	Cr
Compulsory courses (B1 : 14Cr, B2 : 18Cr)							
PHYS0240-2	*Biophysics* - Maryse HOEBEKE	B1	Q2	30	15	-	**5**
PHYS0930-1	*Atomic physics* - Thierry BASTIN	B1	Q1	30	-	-	**4**
PHYS0931-1	*Data processing* - Pierre MAGAIN	B1	Q2	15	30	-	**5**
SMEM0028-1	*Final thesis* - COLLÉGIALITÉ	B2	TA	-	-	-	**18**
Optional courses (B1 : 46Cr, B2 : 42Cr)							
In agreement with the Jury, choose a subject among : (B1 : 46Cr, B2 : 12Cr)							
Basic course (B1 : 46Cr, B2 : 12Cr)							
SSTG0016-1	*Training sessions and personal work* - COLLÉGIALITÉ	B1	Q2	15	45	-	**6**
With the approval of the Jury, choose courses not already chosen totalling 52 ECTS from : (B1 : 40Cr, B2 : 12Cr)							
PHYS0932-1	*Cold atoms and atomic clocks* - Thierry BASTIN **Corequisite :** PHYS0930-1 - Physique atomique	-	Q2	20	10	-	**4**
PHYS2027-2	*Ultracold atoms and Bose-Enstein condensates* - Peter SCHLAGHECK **Corequisite :** PHYS0930-1 - Physique atomique PHYS3021-1 - Mécanique quantique avancée	-	Q2	25	-	-	**4**
PHYS0094-1	*Multiphase flows and dynamic interfaces* - Hervé CAPS **Corequisite :** PHYS0945-1 - Fluides complexes	-	Q2	20	10	-	**4**
AESS0241-1	*Introduction to physics didactics* - Maryse HOEBEKE	-	Q1	20	-	-	**4**
PHYS3035-1	*Optics supplements and lasers applications* (english language) - Serge HABRAKEN	-	Q1	15	20	-	**4**
PHYS0124-1	*Instrumental optics I* (english language) - Serge HABRAKEN	B1	Q1	20	15	-	**4**
PHYS0969-1	*Introduction to biophotonics* - Laurent DREESEN	-	Q2	20	10	-	**4**
PHYS0937-1	*Physical functional materials* (english language) - Philippe GHOSEZ	-	Q1	20	10	-	**4**
PHYS0938-1	*Physics and cultural heritage* - David STRIVAY	-	Q1	15	5	-	**4**
PHYS0939-2	*Physics of non-linearities, chaos and fractals* - Nicolas VANDEWALLE	-	Q2	15	15	-	**4**
PHYS2012-1	*Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK	-	Q1	20	5	-	**4**
PHYS0250-2	*Experimental statistical physics* - Stéphane DORBOLO	-	Q1	10	20	-	**4**
PHYS0941-2	*Theoretical physics : Nuclei and particles* - JeanRené CUDELL	-	Q1	30	-	-	**4**
PHYS0942-3	*Ionising radiations and imaging* - Alain SERET	-	Q1	20	5	-	**4**
PHYS0943-1	*Electronic paramagnetic resonance* - Maryse HOEBEKE	-	Q2	15	5	-	**4**
PHYS3012-3	*Electronic and vibrational spectroscopy* (english language) - Matthieu VERSTRAETE	-	Q1	20	10	-	**4**
PHYS0095-1	*The physics of accelerators and vacuum technologies* - David STRIVAY	-	Q2	10	10	-	**4**
CHIM0202-2	*Physical Chemistry* - Christian DAMBLON, Bernard LEYH	-	Q2	30	-	-	**4**
SPAT0012-1	*General relativity, Part 1: Introduction* - Yves DE ROP	-	Q1	20	-	-	**4**
SPAT0012-2	*General relativity, Part 2: Mathematics methods* - Yves DE ROP	-	Q1	20	-	-	**2**

	Corequisite : SPAT0012-1 - Relativité générale						
SPAT0012-3	*General relativity, Part 3: supplement* - Yves DE ROP **Corequisite :** SPAT0012-2 - Relativité générale	-	Q2	20	-	-	**2**
PHYS0945-1	*Complex fluids* - Nicolas VANDEWALLE	-	Q1	20	10	-	**4**
PHYS0235-2	*Introduction to quantum optics* - John MARTIN **Corequisite :** PHYS3021-1 - Mécanique quantique avancée	-	Q2	25	-	-	**4**
PHYS0949-1	*Atomic structures modelling* - Pascal QUINET **Corequisite :** PHYS0930-1 - Physique atomique	-	Q2	10	10	-	**4**
PHYS0950-1	*Nanoparticles and low-dimensional systems* (english language) - JeanYves RATY	-	Q1	20	10	-	**4**
PHYS3017-1	*Physical science in an historical perspective* - Martine JAMINON - [1d Vis.]	-	Q1	30	-	[+]	**4**
PHYS3013-1	*Physical characterization of materials and interfaces* - Ngoc Duy NGUYEN	-	Q1	15	15	-	**4**
PHYS0970-1	*Physics of superconductors* - Alejandro SILHANEK	-	Q1	30	-	-	**4**
PHYS3019-1	*Techniques of experimental physics* - Geoffroy LUMAY	-	Q1	20	20	-	**4**
PHYS3020-1	*Digital tools of soft matter* - François LUDEWIG, Geoffroy LUMAY	-	Q2	15	15	-	**4**
PHYS3021-1	*Advanced quantum mechanics* - Thierry BASTIN, John MARTIN, Peter SCHLAGHECK	-	Q1	30	-	-	**4**
PHYS3022-1	*Theory of magnetism* (english language) - Eric BOUSQUET	-	Q2	20	-	-	**4**
PHYS0948-1	*Microgravity* - Hervé CAPS, Nicolas VANDEWALLE - [3d FW] **Corequisite :** PHYS0945-1 - Fluides complexes PHYS0094-1 - Ecoulements multiphasiques et dynamique des interfaces	B2	Q2	10	20	[+]	**4**
PHYS0125-3	*Instrumental optics II* (english language) - Serge HABRAKEN **Prerequisite :** PHYS0124-1 - Instrumental optics I	B2	Q2	25	15	-	**4**

[...] Up to 8 ECTS can be chosen in another study path or in another institution.

Course Medical Physics (B1 : 46Cr, B2 : 12Cr)

PHYS0952-3	*Physics fundamental issues in relation with medical x-ray diagnosis, radiotherapy and nuclear medicine* - *Radiobiology part* - Christophe CHAMPION - *Imagery part* - Alain SERET **Corequisite :** PHYS0931-1 - Traitement des données	B1	Q1 10 25	 - 5	 - -		**5**
PHYS0952-7	*Physics fundamental issues in relation with medical x-ray diagnosis, radiotherapy and nuclear medicine, Dosimetry part* - MarieThérèse HOORNAERT **Corequisite :** PHYS0952-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire	B1	Q2	20	-	-	**3**
RADI2001-1	*Radioprotection : Hygiene problems, 1st year* - Roland HUSTINX **Corequisite :** PHYS0952-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire RADP0141-1 - Radioprotection BIOL0007-1 - Biologie tissulaire	B1	Q2	15	-	-	**2**
BIOL0007-1	*Tissue biology* - Marc THIRY	B1	Q2	15	25	-	**5**

PHYL0644-1	*Human Anatomy and Physiology* - Pierre BONNET	B1	Q2	30	-	-	**4**
ANAT0222-1	*Elements of Radiology* - Mladen MILICEVIC	B1	Q1	10	5	-	**2**
STAT0722-1	*Introduction to medical statistics* - Christophe PHILLIPS **Corequisite :** PHYS0128-1 - Bases de l'imagerie par résonance magnétique nucléaire	B1	Q1	10	5	-	**2**
CHIM0620-1	*Radiopharmaceutical Chemistry* - André LUXEN	B1	Q1	20	10	-	**4**
PHYS0128-1	*Magnetic Resonance Imaging - the Basics* (english language) - Evelyne BALTEAU - [3d FW] **Corequisite :** PHYS0930-1 - Physique atomique	B1	Q1	15	-	[+]	**3**
RADP0141-1	*Radioprotection* *- Part a) Radioprotection techniques and complements* - Véra PIRLET *- Part b) Legislation on radioprotection and the organisation of a radiotherapy, radiodiagnostic and nuclear medicine department* - Véra PIRLET	B1	Q2 30 10	15	- -	-	**6**
SSTG0041-1	*Placement in medical radiophysics* - Claire BERNARD, MarieThérèse HOORNAERT, Alain SERET - [12d Internship] **Corequisite :** PHYS0952-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire PHYS0952-7 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire CHIM0620-1 - Chimie nucléaire : chimie des composés radio pharmaceutiques RADP0141-1 - Radioprotection RADI2001-1 - Radioprotection : problèmes d'hygiène	B1	Q2	2	-	[+]	**10**
QUAL0722-1	*Safety and quality assurance* - Eric LENAERTS **Prerequisite :** SSTG0041-1 - Stages en radiophysique médicale	B2	Q1	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	Q2	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* - André LUXEN - [3d FW]	B2	Q2	15	-	[+]	**2**

Focus to be choosen (B2 : 1Nbr)

Research Focus (B2 : 30Cr)

STRA0030-1	*Final thesis complement* - COLLÉGIALITÉ	B2	TA	-	-	-	**11**
PHYS0963-1	*Seminars* - COLLÉGIALITÉ	B2	Q2	-	-	-	**3**

[...] In agreement with the Jury, choose from the ULg course programme complementary courses which have not yet been followed, for a total of 16 credits, a maximum of 12 of which must be outside the subject.

Teaching focus (B2 : 30Cr)

AESS1222-1	*Special didactics in physics : course and exercises (1st part)* - Hervé CAPS, Maryse HOEBEKE	B2	Q1	40	-	-	**3**
AESS1223-1	*Special didactics in physics : placements (1st part)* *- Observation placements* - Hervé CAPS, Maryse HOEBEKE - [10h	B2	Q1 -	-	-	[+]	**3**

	Internship] - *Teaching placements* - Hervé CAPS, Maryse HOEBEKE - [20h Internship]			-	-	[+]	
	- *Reflexive practical work* - Hervé CAPS, Maryse HOEBEKE			-	5	-	
AESS2222-1	*Special didactics in physics : course and exercises (2nd part)* - Hervé CAPS, Maryse HOEBEKE	B2	Q2	35	-	-	**4**
AESS2223-1	*Special didactics in physics : placements (2nd part)* - *Teaching placements* - Hervé CAPS, Maryse HOEBEKE - [20h Internship] - *Reflexive practical work* - Hervé CAPS, Maryse HOEBEKE - *Extra-scholar teaching activities* - Hervé CAPS, Maryse HOEBEKE	B2	Q2 - - -	 - 5 10	 [+] - -		**5**
AESS0202-1	*General didactics: course and exercises ; observation placements ; reflexive practices* - Annick FAGNANT - [10h Internship]	B2	TA	30	10	[+]	**4**
AESS0246-1	*Analysis of scolastic institutions and key-players, educational policies* - Dominique LAFONTAINE - Suppl : MarieThérèse DELHOUNE	B2	Q1	15	-	-	**1**
AESS0004-1	*Media education* - Jérémy HAMERS	B2	Q1	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* - Annick FAGNANT	B2	Q1	15	-	-	**2**
AESS0249-1	*Interdisciplinary seminar* - Annick FAGNANT	B2	Q2	15	-	-	**1**
AESS0339-1	*Understand and manage the diversity of public schools* - Ariane BAYE	B2	Q2	10	15	-	**3**

Professional Focus in Medical Radiological Physics (B2 : 30Cr)

PHYS0954-3	*Physics fundamental problems in relation with medical x-ray diagnosis, radiotherapy and nuclear medicine* - *Applications et techniques spéciales en radiothérapie* - MarieThérèse HOORNAERT - *Applications et techniques spéciales en radiodiagnostic* - Hilde BOSMANS - *Applications et techniques spéciales en médecine nucléaire* - Claire BERNARD, Roland HUSTINX, Alain SERET - *Internal dosimetry of radiopharmaceutical compounds* - Klaus BACHER **Prerequisite :** PHYS0952-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire PHYS0952-7 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire CHIM0620-1 - Chimie nucléaire : chimie des composés radio pharmaceutiques SSTG0041-1 - Stages en radiophysique médicale	B2	Q1 35 15 20 15	 - - - -	 - - - -		**11**
PHYS0954-4	*Physics fundamental problems in relation with medical x-ray diagnosis, radiotherapy and nuclear medicine* - *Computerized Dosimetry specialized in radiotherapy* - Eric LENAERTS - *3D tomographical reconstruction* - Michel DEFRISE, Alain SERET **Prerequisite :** PHYS0952-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire PHYS0952-7 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire	B2	Q2 15 5	 - -	 - -		**3**

SSTG0041-1 - Stages en radiophysique médicale
Corequisite :
PHYS0954-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire

SSTG0015-2	*Training* - COLLÉGIALITÉ - [3mois Internship]	B2	TA	-	-	[+]	**16**

Corequisite :
PHYS0954-3 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire
PHYS0954-4 - Problèmes fondamentaux de physique en relation avec le radiodiagnostic médical, la radiothérapie et la médecine nucléaire

Programme transitoire à destination des étudiants ayant réussi leur master 1 de "Master en sciences physiques, à finalité spécialisée en radiophysique médicale" en 2014-2015

Optional courses (B1 : 30Cr)

Follow-up to the focus chosen in first year (B1 : 30Cr)

Professional Focus in Medical Radiological Physics (B1 : 30Cr)

PHYS0954-3	*Physics fundamental problems in relation with medical x-ray diagnosis, radiotherapy and nuclear medicine*	B1	Q1				**11**
	- *Applications et techniques spéciales en radiothérapie* - MarieThérèse HOORNAERT		35	-	-		
	- *Applications et techniques spéciales en radiodiagnostic* - Hilde BOSMANS		15	-	-		
	- *Applications et techniques spéciales en médecine nucléaire* - Claire BERNARD, Roland HUSTINX, Alain SERET		20	-	-		
	- *Internal dosimetry of radiopharmaceutical compounds* - Klaus BACHER		15	-	-		
PHYS0954-4	*Physics fundamental problems in relation with medical x-ray diagnosis, radiotherapy and nuclear medicine*	B1	Q2				**3**
	- *Computerized Dosimetry specialized in radiotherapy* - Eric LENAERTS		15	-	-		
	- *3D tomographical reconstruction* - Michel DEFRISE, Alain SERET		5	-	-		
SSTG0015-2	*Training* - COLLÉGIALITÉ - [3mois Internship]	B1	TA	-	-	[+]	**16**

Compulsory courses (B1 : 18Cr)

SMEM0028-1	*Final thesis* - COLLÉGIALITÉ	B1	TA	-	-	-	**18**

Optional courses (B1 : 12Cr)

Choose, in accordance with the Jury, 1 option among : (B1 : 12Cr)

Fundamental 3 Option (B1 : 12Cr)

With the approval of the Jury, choose courses not already chosen in the 1st year totalling 12 ECTS from : (B1 : 12Cr)

PHYS0932-1	*Cold atoms and atomic clocks* - Thierry BASTIN	B1	Q2	20	10	-	**4**
PHYS2027-2	*Ultracold atoms and Bose-Enstein condensates* - Peter SCHLAGHECK	B1	Q2	25	-	-	**4**
PHYS0094-1	*Multiphase flows and dynamic interfaces* - Hervé CAPS	B1	Q2	20	10	-	**4**
AESS0241-1	*Introduction to physics didactics* - Maryse HOEBEKE	B1	Q1	20	-	-	**4**
PHYS3035-1	*Optics supplements and lasers applications* (english language) - Serge HABRAKEN	B1	Q1	15	20	-	**4**

PHYS0969-1	*Introduction to biophotonics* - Laurent DREESEN	B1	Q2	20	10	-	**4**
PHYS0937-1	*Physical functional materials* (english language) - Philippe GHOSEZ	B1	Q1	20	10	-	**4**
PHYS0938-1	*Physics and cultural heritage* - David STRIVAY	B1	Q1	15	5	-	**4**
PHYS0939-2	*Physics of non-linearities, chaos and fractals* - Nicolas VANDEWALLE	B1	Q2	15	15	-	**4**
PHYS2012-1	*Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK	B1	Q1	20	5	-	**4**
PHYS0250-2	*Experimental statistical physics* - Stéphane DORBOLO	B1	Q1	10	20	-	**4**
PHYS0941-2	*Theoretical physics : Nuclei and particles* - JeanRené CUDELL	B1	Q1	30	-	-	**4**
PHYS0942-3	*Ionising radiations and imaging* - Alain SERET	B1	Q1	20	5	-	**4**
PHYS0943-1	*Electronic paramagnetic resonance* - Maryse HOEBEKE	B1	Q2	15	5	-	**4**
PHYS3012-3	*Electronic and vibrational spectroscopy* (english language) - Matthieu VERSTRAETE	B1	Q1	20	10	-	**4**
PHYS0095-1	*The physics of accelerators and vacuum technologies* - David STRIVAY	B1	Q2	10	10	-	**4**
CHIM0202-2	*Physical Chemistry* - Christian DAMBLON, Bernard LEYH	B1	Q2	30	-	-	**4**
SPAT0012-1	*General relativity, Part 1: Introduction* - Yves DE ROP	B1	Q1	20	-	-	**4**
SPAT0012-2	*General relativity, Part 2: Mathematics methods* - Yves DE ROP	B1	Q1	20	-	-	**2**
SPAT0012-3	*General relativity, Part 3: supplement* - Yves DE ROP	B1	Q2	20	-	-	**2**
PHYS0945-1	*Complex fluids* - Nicolas VANDEWALLE	B1	Q1	20	10	-	**4**
PHYS0235-2	*Introduction to quantum optics* - John MARTIN	B1	Q2	25	-	-	**4**
PHYS0948-1	*Microgravity* - Hervé CAPS, Nicolas VANDEWALLE - [3d FW]	B1	Q2	10	20	[+]	**4**
PHYS0949-1	*Atomic structures modelling* - Pascal QUINET	B1	Q2	10	10	-	**4**
PHYS0950-1	*Nanoparticles and low-dimensional systems* (english language) - JeanYves RATY	B1	Q1	20	10	-	**4**
PHYS0125-3	*Instrumental optics II* (english language) - Serge HABRAKEN	B1	Q2	25	15	-	**4**
PHYS3017-1	*Physical science in an historical perspective* - Martine JAMINON - [1d Vis.]	B1	Q1	30	-	[+]	**4**
PHYS3013-1	*Physical characterization of materials and interfaces* - Ngoc Duy NGUYEN	B1	Q1	15	15	-	**4**
PHYS0970-1	*Physics of superconductors* - Alejandro SILHANEK	B1	Q1	30	-	-	**4**
PHYS3019-1	*Techniques of experimental physics* - Geoffroy LUMAY	B1	Q1	20	20	-	**4**
PHYS3020-1	*Digital tools of soft matter* - François LUDEWIG, Geoffroy LUMAY	B1	Q2	15	15	-	**4**
PHYS3021-1	*Advanced quantum mechanics* - Thierry BASTIN, John MARTIN, Peter SCHLAGHECK	B1	Q1	30	-	-	**4**
PHYS3022-1	*Theory of magnetism* (english language) - Eric BOUSQUET	B1	Q2	20	-	-	**4**

Option Medical physics 3 (B1 : 12Cr)

QUAL0722-1	*Safety and quality assurance* - Eric LENAERTS	B1	Q1	5	10	-	**2**
RADL0442-1	*Radiobiology and radiopathology elements* - Chantal HUMBLET, Philippe MARTINIVE	B1	Q2	40	20	-	**6**
PHYS2024-1	*Transfer and co-registration of medical images* - Mohamed Ali BAHRI	B1	Q1	15	-	-	**2**
CHIM0621-2	*Production and application of radioelements* - André LUXEN - [3d FW]	B1	Q2	15	-	[+]	**2**

Programme transitoire à destination des étudiants ayant réussi leur master 1 de "Master en sciences physiques, à finalité didactique" en 2014-2015

Optional courses (B1 : 30Cr)

Follow-up to the focus chosen in first year (B1 : 30Cr)

Teaching focus (B1 : 30Cr)

AESS1222-1	*Special didactics in physics : course and exercises (1st part)* - Hervé CAPS, Maryse HOEBEKE	B1	Q1	40	-	-	**3**
AESS1223-1	*Special didactics in physics : placements (1st part)*	B1	Q1				**3**
	- *Observation placements* - Hervé CAPS, Maryse HOEBEKE - [10h Internship]			-	[+]		
	- *Teaching placements* - Hervé CAPS, Maryse HOEBEKE - [20h Internship]			-	[+]		
	- *Reflexive practical work* - Hervé CAPS, Maryse HOEBEKE			5	-		
AESS2222-1	*Special didactics in physics : course and exercises (2nd part)* - Hervé CAPS, Maryse HOEBEKE	B1	Q2	35	-	-	**4**
AESS2223-1	*Special didactics in physics : placements (2nd part)*	B1	Q2				**5**
	- *Teaching placements* - Hervé CAPS, Maryse HOEBEKE - [20h Internship]			-	[+]		
	- *Reflexive practical work* - Hervé CAPS, Maryse HOEBEKE			5	-		
	- *Extra-scholar teaching activities* - Hervé CAPS, Maryse HOEBEKE			10	-		
AESS0202-1	*General didactics: course and exercises ; observation placements ; reflexive practices* - Annick FAGNANT - [10h Internship]	B1	TA	30	10	[+]	**4**
AESS0246-1	*Analysis of scolastic institutions and key-players, educational policies* - Dominique LAFONTAINE - Suppl : MarieThérèse DELHOUNE	B1	Q1	15	-	-	**1**
AESS0004-1	*Media education* - Jérémy HAMERS	B1	Q1	15	-	-	**1**
AESS0248-1	*Elements of sociology of education* - JeanFrançois GUILLAUME	B1	Q2	10	-	-	**1**
AESS0140-1	*Professional ethics and training to neutrality and citizenship* - Anne HERLA	B1	Q2	25	-	-	**2**
AESS0143-1	*Educational Psychology of adolescents and young adults* - Annick FAGNANT	B1	Q1	15	-	-	**2**
AESS0249-1	*Interdisciplinary seminar* - Annick FAGNANT	B1	Q2	15	-	-	**1**
AESS0339-1	*Understand and manage the diversity of public schools* - Ariane BAYE	B1	Q2	10	15	-	**3**

Compulsory courses (B1 : 18Cr)

SMEM0028-1	*Final thesis* - COLLÉGIALITÉ	B1	TA	-	-	-	**18**

Optional courses (B1 : 12Cr)

Choose, in accordance with the Jury, 1 option among : (B1 : 12Cr)

Fundamental 3 Option (B1 : 12Cr)

With the approval of the Jury, choose courses not already chosen in the 1st year totalling 12 ECTS from : (B1 : 12Cr)

PHYS0932-1	*Cold atoms and atomic clocks* - Thierry BASTIN	B1	Q2	20	10	-	**4**
PHYS2027-2	*Ultracold atoms and Bose-Enstein condensates* - Peter SCHLAGHECK	B1	Q2	25	-	-	**4**

PHYS0094-1	*Multiphase flows and dynamic interfaces* - Hervé CAPS	B1	Q2	20	10	-	**4**
AESS0241-1	*Introduction to physics didactics* - Maryse HOEBEKE	B1	Q1	20	-	-	**4**
PHYS3035-1	*Optics supplements and lasers applications* (english language) - Serge HABRAKEN	B1	Q1	15	20	-	**4**
PHYS0969-1	*Introduction to biophotonics* - Laurent DREESEN	B1	Q2	20	10	-	**4**
PHYS0937-1	*Physical functional materials* (english language) - Philippe GHOSEZ	B1	Q1	20	10	-	**4**
PHYS0938-1	*Physics and cultural heritage* - David STRIVAY	B1	Q1	15	5	-	**4**
PHYS0939-2	*Physics of non-linearities, chaos and fractals* - Nicolas VANDEWALLE	B1	Q2	15	15	-	**4**
PHYS2012-1	*Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK	B1	Q1	20	5	-	**4**
PHYS0250-2	*Experimental statistical physics* - Stéphane DORBOLO	B1	Q1	10	20	-	**4**
PHYS0941-2	*Theoretical physics : Nuclei and particles* - JeanRené CUDELL	B1	Q1	30	-	-	**4**
PHYS0942-3	*Ionising radiations and imaging* - Alain SERET	B1	Q1	20	5	-	**4**
PHYS0943-1	*Electronic paramagnetic resonance* - Maryse HOEBEKE	B1	Q2	15	5	-	**4**
PHYS3012-3	*Electronic and vibrational spectroscopy* (english language) - Matthieu VERSTRAETE	B1	Q1	20	10	-	**4**
PHYS0095-1	*The physics of accelerators and vacuum technologies* - David STRIVAY	B1	Q2	10	10	-	**4**
CHIM0202-2	*Physical Chemistry* - Christian DAMBLON, Bernard LEYH	B1	Q2	30	-	-	**4**
SPAT0012-1	*General relativity, Part 1: Introduction* - Yves DE ROP	B1	Q1	20	-	-	**4**
SPAT0012-2	*General relativity, Part 2: Mathematics methods* - Yves DE ROP	B1	Q1	20	-	-	**2**
SPAT0012-3	*General relativity, Part 3: supplement* - Yves DE ROP	B1	Q2	20	-	-	**2**
PHYS0945-1	*Complex fluids* - Nicolas VANDEWALLE	B1	Q1	20	10	-	**4**
PHYS0235-2	*Introduction to quantum optics* - John MARTIN	B1	Q2	25	-	-	**4**
PHYS0948-1	*Microgravity* - Hervé CAPS, Nicolas VANDEWALLE - [3d FW]	B1	Q2	10	20	[+]	**4**
PHYS0949-1	*Atomic structures modelling* - Pascal QUINET	B1	Q2	10	10	-	**4**
PHYS0950-1	*Nanoparticles and low-dimensional systems* (english language) - JeanYves RATY	B1	Q1	20	10	-	**4**
PHYS0125-3	*Instrumental optics II* (english language) - Serge HABRAKEN	B1	Q2	25	15	-	**4**
PHYS3017-1	*Physical science in an historical perspective* - Martine JAMINON - [1d Vis.]	B1	Q1	30	-	[+]	**4**
PHYS3013-1	*Physical characterization of materials and interfaces* - Ngoc Duy NGUYEN	B1	Q1	15	15	-	**4**
PHYS0970-1	*Physics of superconductors* - Alejandro SILHANEK	B1	Q1	30	-	-	**4**
PHYS3019-1	*Techniques of experimental physics* - Geoffroy LUMAY	B1	Q1	20	20	-	**4**
PHYS3020-1	*Digital tools of soft matter* - François LUDEWIG, Geoffroy LUMAY	B1	Q2	15	15	-	**4**
PHYS3021-1	*Advanced quantum mechanics* - Thierry BASTIN, John MARTIN, Peter SCHLAGHECK	B1	Q1	30	-	-	**4**
PHYS3022-1	*Theory of magnetism* (english language) - Eric BOUSQUET	B1	Q2	20	-	-	**4**

Option Medical physics 3 (B1 : 12Cr)

QUAL0722-1	*Safety and quality assurance* - Eric LENAERTS	B1	Q1	5	10	-	**2**
RADL0442-1	*Radiobiology and radiopathology elements* - Chantal HUMBLET,	B1	Q2	40	20	-	**6**

	Philippe MARTINIVE						
PHYS2024-1	*Transfer and co-registration of medical images* - Mohamed Ali BAHRI	B1	Q1	15	-	-	**2**
CHIM0621-2	*Production and application of radioelements* - André LUXEN - [3d FW]	B1	Q2	15	-	[+]	**2**

Programme transitoire à destination des étudiants ayant réussi leur master 1 de "Master en sciences physiques, à finalité approfondie" en 2014-2015

Optional courses (B1 : 30Cr)

Follow-up to the focus chosen in first year (B1 : 30Cr)

Research Focus (B1 : 30Cr)

STRA0030-1	*Final thesis complement* - COLLÉGIALITÉ	B1	TA	-	-	-	**11**
PHYS0963-1	*Seminars* - COLLÉGIALITÉ	B1	Q2	-	-	-	**3**

Choose courses totalling 16 ECTS from the following :

[...] In agreement with the Jury, choose from the ULg course programme complementary courses which have not yet been followed, for a total of 16 credits, a maximum of 12 of which must be outside the subject.

Compulsory courses (B1 : 18Cr)

SMEM0028-1	*Final thesis* - COLLÉGIALITÉ	B1	TA	-	-	-	**18**

Optional courses (B1 : 12Cr)

Choose, in accordance with the Jury, 1 option among : (B1 : 12Cr)

Fundamental 3 Option (B1 : 12Cr)

With the approval of the Jury, choose courses not already chosen in the 1st year totalling 12 ECTS from : (B1 : 12Cr)

PHYS0932-1	*Cold atoms and atomic clocks* - Thierry BASTIN	B1	Q2	20	10	-	**4**
PHYS2027-2	*Ultracold atoms and Bose-Enstein condensates* - Peter SCHLAGHECK	B1	Q2	25	-	-	**4**
PHYS0094-1	*Multiphase flows and dynamic interfaces* - Hervé CAPS	B1	Q2	20	10	-	**4**
AESS0241-1	*Introduction to physics didactics* - Maryse HOEBEKE	B1	Q1	20	-	-	**4**
PHYS3035-1	*Optics supplements and lasers applications* (english language) - Serge HABRAKEN	B1	Q1	15	20	-	**4**
PHYS0969-1	*Introduction to biophotonics* - Laurent DREESEN	B1	Q2	20	10	-	**4**
PHYS0937-1	*Physical functional materials* (english language) - Philippe GHOSEZ	B1	Q1	20	10	-	**4**
PHYS0938-1	*Physics and cultural heritage* - David STRIVAY	B1	Q1	15	5	-	**4**
PHYS0939-2	*Physics of non-linearities, chaos and fractals* - Nicolas VANDEWALLE	B1	Q2	15	15	-	**4**
PHYS2012-1	*Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK	B1	Q1	20	5	-	**4**
PHYS0250-2	*Experimental statistical physics* - Stéphane DORBOLO	B1	Q1	10	20	-	**4**
PHYS0941-2	*Theoretical physics : Nuclei and particles* - JeanRené CUDELL	B1	Q1	30	-	-	**4**
PHYS0942-3	*Ionising radiations and imaging* - Alain SERET	B1	Q1	20	5	-	**4**

PHYS0943-1	*Electronic paramagnetic resonance* - Maryse HOEBEKE	B1	Q2	15	5	-	**4**
PHYS3012-3	*Electronic and vibrational spectroscopy* (english language) - Matthieu VERSTRAETE	B1	Q1	20	10	-	**4**
PHYS0095-1	*The physics of accelerators and vacuum technologies* - David STRIVAY	B1	Q2	10	10	-	**4**
CHIM0202-2	*Physical Chemistry* - Christian DAMBLON, Bernard LEYH	B1	Q2	30	-	-	**4**
SPAT0012-1	*General relativity, Part 1: Introduction* - Yves DE ROP	B1	Q1	20	-	-	**4**
SPAT0012-2	*General relativity, Part 2: Mathematics methods* - Yves DE ROP	B1	Q1	20	-	-	**2**
SPAT0012-3	*General relativity, Part 3: supplement* - Yves DE ROP	B1	Q2	20	-	-	**2**
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PHYS0948-1	*Microgravity* - Hervé CAPS, Nicolas VANDEWALLE - [3d FW]	B1	Q2	10	20	[+]	**4**
PHYS0949-1	*Atomic structures modelling* - Pascal QUINET	B1	Q2	10	10	-	**4**
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PHYS3017-1	*Physical science in an historical perspective* - Martine JAMINON - [1d Vis.]	B1	Q1	30	-	[+]	**4**
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PHYS3019-1	*Techniques of experimental physics* - Geoffroy LUMAY	B1	Q1	20	20	-	**4**
PHYS3020-1	*Digital tools of soft matter* - François LUDEWIG, Geoffroy LUMAY	B1	Q2	15	15	-	**4**
PHYS3021-1	*Advanced quantum mechanics* - Thierry BASTIN, John MARTIN, Peter SCHLAGHECK	B1	Q1	30	-	-	**4**
PHYS3022-1	*Theory of magnetism* (english language) - Eric BOUSQUET	B1	Q2	20	-	-	**4**

Option Medical physics 3 (B1 : 12Cr)

QUAL0722-1	*Safety and quality assurance* - Eric LENAERTS	B1	Q1	5	10	-	**2**
RADL0442-1	*Radiobiology and radiopathology elements* - Chantal HUMBLET, Philippe MARTINIVE	B1	Q2	40	20	-	**6**
PHYS2024-1	*Transfer and co-registration of medical images* - Mohamed Ali BAHRI	B1	Q1	15	-	-	**2**
CHIM0621-2	*Production and application of radioelements* - André LUXEN - [3d FW]	B1	Q2	15	-	[+]	**2**