Université de Liège

Study programmes 2013-2014
Faculty of Sciences
Master in Space Sciences, Research focus

First Year

Compulsory courses

		Th	Pr	Au	Cr
SPAT0039-1	*Spectroscopy in Astrophysics and Geophysics* - Jerôme LOICQ	20	10	-	**3**
PHYS0124-1	*Instrumental Optics I* - Serge HABRAKEN	20	15	-	**3**
SPAT0040-1	*Fluid mechanics* - Pierre DAUBY	20	10	-	**3**
SPAT0001-1	*Plasma Physics* - Hervé LAMY, Anne THOUL	25	5	-	**3**
SPAT0002-1	*Numerical methods and programming basics* - Guy MUNHOVEN	10	20	-	**3**

Optional courses

Choose, with the approval of the Board of Studies, several courses totaling 15 ECTS from the two options below or from other Masters, particularly the Master in Aerospace engineering :

Astrophysics

SPAT0041-2	*Solar atmosphere, activity and Earth-Sun relations* - Frédéric CLETTE	20	10	-	**3**
SPAT0056-1	*Planetary and exoplanetary atmospheres* - JeanClaude GÉRARD, Denis GRODENT	30	15	-	**5**
SPAT0043-1	*Small bodies in the solar system* - Emmanuel JEHIN	15	5	-	**2**
SPAT0044-1	*Stellar Structure and evolution I* - MarcAntoine DUPRET	20	20	-	**3**
SPAT0045-1	*Stellar structure and evolution II* - MarcAntoine DUPRET	20	20	-	**3**
SPAT0005-1	*Stellar stability and asteroseismology* - MarcAntoine DUPRET	30	10	-	**4**
SPAT0007-2	*Variable stars* - Grégor RAUW	20	10	-	**3**
SPAT0006-1	*Stellar atmospheres* - Grégor RAUW	20	10	-	**3**
SPAT0008-1	*Interstellar Medium* - Damien HUTSEMEKERS, Yaël NAZÉ	20	10	-	**3**
GEOL0263-1	*Astrobiology* - Philippe CLAEYS, Véronique DEHANT, Moreno GALLENI, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years)	30	15	-	**4**
SPAT0009-1	*High-energy astrophysics* - Grégor RAUW	25	5	-	**4**
SPAT0010-1	*Theoretical physical cosmology* - Christian BARBIER, Michel TYTGAT	40	-	-	**4**
SPAT0011-1	*Extragalactic astrophysics* - Pierre MAGAIN	20	10	-	**3**
SPAT0012-1	*General relativity* - Yves DE ROP	60	-	-	**6**
SPAT0014-1	*Introduction to time series analysis* - Eric GOSSET	20	5	-	**3**
PHYS0125-3	*Instrumental Optics II* - Serge HABRAKEN	25	30	-	**5**
SPAT0015-1	*Signal acquisition and processing : application to embedded systems* - Christian SERVAIS	10	30	-	**4**
SSTG0043-1	*Placement* - N... - Suppl : Christian BARBIER, Yaël NAZÉ, Grégor RAUW, JeanPierre SWINGS	-	140	-	**10**
AERO0018-3	*Space Experiment Development* - Pierre ROCHUS	30	30	-	**5**
SPAT0017-1	*Current questions and seminars* - Alberto BORGES, JeanRené CUDELL, Benoît HUBERT, Damien HUTSEMEKERS	-	30	-	**3**
SPAT0018-1	*Evolution of ideas in Astronomy* - Yaël NAZÉ	15	-	-	**2**
SPAT0019-1	*Special Relativity* - Jean SURDEJ	15	-	-	**2**
SPAT0020-2	*Introduction to astrochemistry* - Michaël DE BECKER	30	10	-	**4**
SPAT0021-1	*Introduction to astroparticles* - Joseph CUGNON	20	10	-	**3**
SPAT0060-1	*Astroparticles, Part 1 : Astroparticles and standard model* - JeanRené CUDELL	20	10	-	**4**
SPAT0060-2	*Astroparticles, Part 2 : Astroparticles and gravitational effects* - JeanRené CUDELL	10	5	-	**2**
SPAT0061-1	*Group theory and astroparticles* - Floarea STANCU	30	-	-	**3**
SPAT0062-1	*Quantum field theory, Part 1 : Quantum electrodynamics* - JeanRené CUDELL	20	10	-	**4**
SPAT0062-2	*Quantum field theory, Part 2 : Elements of renormalization* - JeanRené CUDELL	10	5	-	**2**
PHYS2012-1	*Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK	20	5	-	**3**
SPAT0063-1	*Introduction to exoplanetary* - Michaël GILLON	15	5	-	**2**

Earth and Planetary Sciences

SPAT0023-1	*Terrestrial magnetosphere and polar lights* - Benoît HUBERT	30	10	-	**4**
SPAT0024-2	*Meteorology* - Louis FRANÇOIS	40	20	-	**6**
MECA0053-6	*Geophysical fluid dynamics* - JeanMarie BECKERS	30	-	-	**4**
OCEA0037-2	*Oceanic and atmospheric waves* - JeanMarie BECKERS	30	10	-	**4**
OCEA0003-1	*Introduction to satellite oceanography* - Yves CORNET	15	15	-	**3**
OCEA0045-1	*Statistical methods of analysis of oceanographic data* - Aïda ALVERA AZCARATE	20	10	-	**3**
GEOG0037-1	*GNSS : Theory and applications* - René WARNANT	35	15	-	**5**
GEOG0038-1	*Space geodesy* - René WARNANT - [1d FW]	20	-	[+]	**3**

SPAT0025-1	*Environmental modelling* - Louis FRANÇOIS, Guy MUNHOVEN	20	10	-	**4**
SPAT0026-1	*Paleoenvironment and evolution of the Earth system* - Louis FRANÇOIS	30	10	-	**4**
SPAT0027-3	*Climate change and impacts* - Louis FRANÇOIS, Guy MUNHOVEN	15	45	-	**5**
SPAT0028-2	*Planetary magnetospheres and aurorae* - Denis GRODENT	20	10	-	**3**
OCEA0046-1	*Numerical modelling in geophysics* - JeanMarie BECKERS	20	30	-	**5**
SPAT0041-2	*Solar atmosphere, activity and Earth-Sun relations* - Frédéric CLETTE	20	10	-	**3**
SPAT0056-1	*Planetary and exoplanetary atmospheres* - JeanClaude GÉRARD, Denis GRODENT	30	15	-	**5**
SPAT0043-1	*Small bodies in the solar system* - Emmanuel JEHIN	15	5	-	**2**
GEOL0263-1	*Astrobiology* - Philippe CLAEYS, Véronique DEHANT, Moreno GALLENI, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years)	30	15	-	**4**
SPAT0014-1	*Introduction to time series analysis* - Eric GOSSET	20	5	-	**3**
PHYS0125-3	*Instrumental Optics II* - Serge HABRAKEN	25	30	-	**5**
SPAT0015-1	*Signal acquisition and processing : application to embedded systems* - Christian SERVAIS	10	30	-	**4**
SSTG0043-1	*Placement* - N... - Suppl : Christian BARBIER, Yaël NAZÉ, Grégor RAUW, JeanPierre SWINGS	-	140	-	**10**
AERO0018-3	*Space Experiment Development* - Pierre ROCHUS	30	30	-	**5**
SPAT0029-1	*Space environment* - Denis GRODENT	15	15	-	**3**
SPAT0032-2	*Remote sensing* - Christian BARBIER	30	30	-	**5**
SPAT0063-1	*Introduction to exoplanetary* - Michaël GILLON	15	5	-	**2**

Research Focus

Compulsory courses

SPAT0033-1	*Astrophysics* - Pierre MAGAIN	30	15	-	**4,5**
SPAT0055-1	*Atmosphere of Earth* - Denis GRODENT	30	15	-	**4,5**
OCEA0047-1	*Dynamic oceanography* - JeanMarie BECKERS	45	-	-	**4,5**
SPAT0035-1	*Space exploration* - Grégor RAUW	30	10	-	**4**
SPAT0036-1	*Celestial mechanics and space trajectories* - Grégor RAUW	20	10	-	**3**
PHYS0931-1	*Data processing* - Pierre MAGAIN	15	30	-	**3**
SPAT0057-1	*Observing the Sky* - Jean SURDEJ - [5d FW]	20	10	[+]	**5**
SPAT0058-1	*Observing Earth from space* - N... - Suppl : Christian BARBIER	15	-	-	**1,5**

Second Year

Compulsory course

SMEM0029-1	*Final thesis* - COLLÉGIALITÉ	-	-	-	**27**

Optional courses

[...] Choose, with the approval of the Board of Studies, several courses totaling 9 ECTS from the two options below or from other Masters, particularly the Master in Aerospace engineering :

Choose one option from the following :

Option Astrophysics

Choose, in agreement with the Board of Studies, several courses totalling 24 credits, amongst :

SPAT0041-2	*Solar atmosphere, activity and Earth-Sun relations* - Frédéric CLETTE	20	10	-	**3**
SPAT0056-1	*Planetary and exoplanetary atmospheres* - JeanClaude GÉRARD, Denis GRODENT	30	15	-	**5**
SPAT0043-1	*Small bodies in the solar system* - Emmanuel JEHIN	15	5	-	**2**
SPAT0044-1	*Stellar Structure and evolution I* - MarcAntoine DUPRET	20	20	-	**3**
SPAT0045-1	*Stellar structure and evolution II* - MarcAntoine DUPRET	20	20	-	**3**
SPAT0005-1	*Stellar stability and asteroseismology* - MarcAntoine DUPRET	30	10	-	**4**
SPAT0007-2	*Variable stars* - Grégor RAUW	20	10	-	**3**
SPAT0006-1	*Stellar atmospheres* - Grégor RAUW	20	10	-	**3**
SPAT0008-1	*Interstellar Medium* - Damien HUTSEMEKERS, Yaël NAZÉ	20	10	-	**3**
GEOL0263-1	*Astrobiology* - Philippe CLAEYS, Véronique DEHANT, Moreno GALLENI, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years)	30	15	-	**4**

SPAT0009-1	*High-energy astrophysics* - Grégor RAUW	25	5	-	**4**
SPAT0010-1	*Theoretical physical cosmology* - Christian BARBIER, Michel TYTGAT	40	-	-	**4**
SPAT0011-1	*Extragalactic astrophysics* - Pierre MAGAIN	20	10	-	**3**
SPAT0012-1	*General relativity* - Yves DE ROP	60	-	-	**6**
SPAT0014-1	*Introduction to time series analysis* - Eric GOSSET	20	5	-	**3**
PHYS0125-3	*Instrumental Optics II* - Serge HABRAKEN	25	30	-	**5**
SPAT0015-1	*Signal acquisition and processing : application to embedded systems* - Christian SERVAIS	10	30	-	**4**
SSTG0043-1	*Placement* - N... - Suppl : Christian BARBIER, Yaël NAZÉ, Grégor RAUW, JeanPierre SWINGS	-	140	-	**10**
AERO0018-3	*Space Experiment Development* - Pierre ROCHUS	30	30	-	**5**
SPAT0017-1	*Current questions and seminars* - Alberto BORGES, JeanRené CUDELL, Benoît HUBERT, Damien HUTSEMEKERS	-	30	-	**3**
SPAT0018-1	*Evolution of ideas in Astronomy* - Yaël NAZÉ	15	-	-	**2**
SPAT0019-1	*Special Relativity* - Jean SURDEJ	15	-	-	**2**
SPAT0020-2	*Introduction to astrochemistry* - Michaël DE BECKER	30	10	-	**4**
SPAT0021-1	*Introduction to astroparticles* - Joseph CUGNON	20	10	-	**3**
SPAT0060-1	*Astroparticles, Part 1 : Astroparticles and standard model* - JeanRené CUDELL	20	10	-	**4**
SPAT0060-2	*Astroparticles, Part 2 : Astroparticles and gravitational effects* - JeanRené CUDELL	10	5	-	**2**
SPAT0061-1	*Group theory and astroparticles* - Floarea STANCU	30	-	-	**3**
SPAT0062-1	*Quantum field theory, Part 1 : Quantum electrodynamics* - JeanRené CUDELL	20	10	-	**4**
SPAT0062-2	*Quantum field theory, Part 2 : Elements of renormalization* - JeanRené CUDELL	10	5	-	**2**
PHYS2012-1	*Relativistic quantum mechanics and relativistic statistics* - Peter SCHLAGHECK	20	5	-	**3**
SPAT0063-1	*Introduction to exoplanetary* - Michaël GILLON	15	5	-	**2**

Option Earth and Planetary Sciences

Choose, in agreement with the Board of Studies, several courses totalling 24 credits, amongst :

SPAT0023-1	*Terrestrial magnetosphere and polar lights* - Benoît HUBERT	30	10	-	**4**
SPAT0024-2	*Meteorology* - Louis FRANÇOIS	40	20	-	**6**
MECA0053-6	*Geophysical fluid dynamics* - JeanMarie BECKERS	30	-	-	**4**
OCEA0037-2	*Oceanic and atmospheric waves* - JeanMarie BECKERS	30	10	-	**4**
OCEA0003-1	*Introduction to satellite oceanography* - Yves CORNET	15	15	-	**3**
OCEA0045-1	*Statistical methods of analysis of oceanographic data* - Aïda ALVERA AZCARATE	20	10	-	**3**
GEOG0037-1	*GNSS : Theory and applications* - René WARNANT	35	15	-	**5**
GEOG0038-1	*Space geodesy* - René WARNANT - [1d FW]	20	-	[+]	**3**
SPAT0025-1	*Environmental modelling* - Louis FRANÇOIS, Guy MUNHOVEN	20	10	-	**4**
SPAT0026-1	*Paleoenvironment and evolution of the Earth system* - Louis FRANÇOIS	30	10	-	**4**
SPAT0027-3	*Climate change and impacts* - Louis FRANÇOIS, Guy MUNHOVEN	15	45	-	**5**
SPAT0028-2	*Planetary magnetospheres and aurorae* - Denis GRODENT	20	10	-	**3**
OCEA0046-1	*Numerical modelling in geophysics* - JeanMarie BECKERS	20	30	-	**5**
SPAT0041-2	*Solar atmosphere, activity and Earth-Sun relations* - Frédéric CLETTE	20	10	-	**3**
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SSTG0043-1	*Placement* - N... - Suppl : Christian BARBIER, Yaël NAZÉ, Grégor RAUW, JeanPierre SWINGS	-	140	-	**10**
AERO0018-3	*Space Experiment Development* - Pierre ROCHUS	30	30	-	**5**
SPAT0029-1	*Space environment* - Denis GRODENT	15	15	-	**3**
SPAT0032-2	*Remote sensing* - Christian BARBIER	30	30	-	**5**
SPAT0063-1	*Introduction to exoplanetary* - Michaël GILLON	15	5	-	**2**