

First Year

Compulsory courses

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|------------|---|----|----|---|---|
| SPAT0039-1 | <i>Spectroscopy in Astrophysics and Geophysics</i> - Jérôme LOICQ | 20 | 10 | - | 3 |
| PHYS0124-1 | <i>Instrumental Optics I</i> - Serge HABRAKEN | 20 | 15 | - | 3 |
| SPAT0040-1 | <i>Fluid mechanics</i> - Pierre DAUBY | 20 | 10 | - | 3 |
| SPAT0001-1 | <i>Plasma Physics</i> - Hervé LAMY, Anne THOUL | 25 | 5 | - | 3 |
| SPAT0002-1 | <i>Numerical methods and programming basics</i> - 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

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|------------|---|----|-----|---|----|
| SPAT0041-2 | <i>Solar atmosphere, activity and Earth-Sun relations</i> - Frédéric CLETTE | 20 | 10 | - | 3 |
| SPAT0056-1 | <i>Planetary and exoplanetary atmospheres</i> - Jean-Claude GÉRARD, Denis GRODENT | 30 | 15 | - | 5 |
| SPAT0043-1 | <i>Small bodies in the solar system</i> - Emmanuel JEHIN | 15 | 5 | - | 2 |
| SPAT0044-1 | <i>Stellar Structure and evolution I</i> - Marc-Antoine DUPRET | 20 | 20 | - | 3 |
| SPAT0045-1 | <i>Stellar structure and evolution II</i> - Marc-Antoine DUPRET | 20 | 20 | - | 3 |
| SPAT0005-1 | <i>Stellar stability and asteroseismology</i> - Marc-Antoine DUPRET | 30 | 10 | - | 4 |
| SPAT0007-2 | <i>Variable stars</i> - Grégor RAUW | 20 | 10 | - | 3 |
| SPAT0006-1 | <i>Stellar atmospheres</i> - Grégor RAUW | 20 | 10 | - | 3 |
| SPAT0008-1 | <i>Interstellar Medium</i> - Damien HUTSEMEKERS, Yaël NAZÉ | 20 | 10 | - | 3 |
| GEOL0263-1 | <i>Astrobiology</i> - Philippe CLAEYS, Véronique DEHANT, Moreno GALLENI, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years) | 30 | 15 | - | 4 |
| SPAT0009-1 | <i>High-energy astrophysics</i> - Grégor RAUW | 25 | 5 | - | 4 |
| SPAT0010-1 | <i>Theoretical physical cosmology</i> - Christian BARBIER, Michel TYTGAT | 40 | - | - | 4 |
| SPAT0011-1 | <i>Extragalactic astrophysics</i> - Pierre MAGAIN | 20 | 10 | - | 3 |
| SPAT0053-1 | (pas organisé en 2011-2012) <i>Tensorial analysis</i> | 15 | - | - | 2 |
| SPAT0012-1 | <i>General relativity I</i> - Yves DE ROP | 60 | - | - | 6 |
| SPAT0013-2 | (pas organisé en 2011-2012) <i>General relativity II</i> | 15 | - | - | 2 |
| SPAT0014-1 | <i>Introduction to time series analysis in astronomy</i> - Eric GOSSET | 20 | 5 | - | 3 |
| PHYS0125-3 | <i>Instrumental Optics II</i> - Serge HABRAKEN | 25 | 30 | - | 5 |
| SPAT0015-1 | <i>Signal acquisition and processing : application to embedded systems</i> - Christian SERVAIS | 10 | 30 | - | 4 |
| SPAT0016-2 | <i>Space mission design, part 2</i> - Jean-Marc DEFISE | - | 140 | - | 15 |
| AERO0018-3 | <i>Space Experiment Development</i> - Pierre ROCHUS | 30 | 30 | - | 5 |
| SPAT0017-1 | <i>Current questions and seminars</i> - Alberto BORGES, Jean-René CUDELL, Benoît HUBERT, Damien HUTSEMEKERS | - | 30 | - | 3 |
| SPAT0018-1 | <i>Evolution of ideas in Astronomy</i> - Yaël NAZÉ | 15 | - | - | 2 |
| SPAT0019-1 | <i>Special Relativity</i> - Jean SURDEJ | 15 | - | - | 2 |
| SPAT0020-2 | <i>Introduction to astrochemistry</i> - Michaël DE BECKER | 30 | 10 | - | 4 |
| SPAT0021-1 | <i>Introduction to astroparticles</i> - Joseph CUGNON | 20 | 10 | - | 3 |
| SPAT0022-1 | <i>Astroparticles</i> - Jean-René CUDELL | 30 | 15 | - | 4 |
| SPAT0046-1 | <i>Symmetries in Particle Astrophysics</i> - Floarea STANCU | 30 | - | - | 3 |
| SPAT0047-1 | <i>Quantum field theory</i> - Jean-René CUDELL | 30 | - | - | 3 |
| PHYS2012-1 | <i>Relativistic quantum mechanics and relativistic statistics</i> - Peter SCHLAGHECK | 20 | 5 | - | 3 |

Earth and Planetary Sciences

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|------------|---|----|----|-----|---|
| SPAT0023-1 | <i>Terrestrial magnetosphere and polar lights</i> - Benoît HUBERT | 30 | 10 | - | 4 |
| SPAT0024-2 | <i>Meteorology</i> - Louis FRANÇOIS | 40 | 20 | - | 6 |
| MECA0053-6 | <i>Geophysical fluid dynamics</i> - Jean-Marie BECKERS | 30 | - | - | 4 |
| OCEA0037-2 | <i>Oceanic and atmospheric waves</i> - Jean-Marie BECKERS | 30 | 10 | - | 4 |
| OCEA0003-1 | <i>Introduction to satellite oceanography</i> - Yves CORNET | 15 | 15 | - | 3 |
| OCEA0045-1 | <i>Statistical methods of analysis of oceanographic data</i> - Aïda ALVERA AZCARATE | 20 | 10 | - | 3 |
| GEOG0037-1 | <i>GNSS : Theory and applications</i> - René WARNANT | 35 | 15 | - | 5 |
| GEOG0038-1 | <i>Space geodesy</i> - René WARNANT - [1d FW] | 20 | - | [+] | 3 |
| SPAT0025-1 | <i>Environmental modelling</i> - Louis FRANÇOIS, Guy MUNHOVEN | 20 | 10 | - | 4 |
| SPAT0026-1 | <i>Paleoenvironment and evolution of the Earth system</i> - Louis FRANÇOIS | 30 | 10 | - | 4 |
| SPAT0027-3 | <i>Climate change and impacts</i> - Louis FRANÇOIS, Guy MUNHOVEN | 15 | 45 | - | 5 |

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| SPAT0028-2 | <i>Planetary magnetospheres and aurorae</i> - Denis GRODENT | 20 | 10 | - | 3 |
| OCEA0046-1 | <i>Numerical modeling in geophysics</i> - Jean-Marie BECKERS | 20 | 30 | - | 5 |
| SPAT0041-2 | <i>Solar atmosphere, activity and Earth-Sun relations</i> - Frédéric CLETTE | 20 | 10 | - | 3 |
| SPAT0056-1 | <i>Planetary and exoplanetary atmospheres</i> - Jean-Claude GÉRARD, Denis GRODENT | 30 | 15 | - | 5 |
| SPAT0043-1 | <i>Small bodies in the solar system</i> - Emmanuel JEHIN | 15 | 5 | - | 2 |
| GEOL0263-1 | <i>Astrobiology</i> - Philippe CLAEYS, Véronique DEHANT, Moreno GALLEN, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years) | 30 | 15 | - | 4 |
| SPAT0014-1 | <i>Introduction to time series analysis in astronomy</i> - Eric GOSSET | 20 | 5 | - | 3 |
| PHYS0125-3 | <i>Instrumental Optics II</i> - Serge HABRAKEN | 25 | 30 | - | 5 |
| SPAT0015-1 | <i>Signal acquisition and processing : application to embedded systems</i> - Christian SERVAIS | 10 | 30 | - | 4 |
| SPAT0016-2 | <i>Space mission design, part 2</i> - Jean-Marc DEFISE | - | 140 | - | 15 |
| AERO0018-3 | <i>Space Experiment Development</i> - Pierre ROCHUS | 30 | 30 | - | 5 |
| SPAT0029-1 | <i>Space environment</i> - Denis GRODENT | 15 | 15 | - | 3 |
| SPAT0030-1 | <i>Internal Geophysics</i> - N... | 30 | - | - | 3 |
| SPAT0032-2 | <i>Teledetection</i> - Christian BARBIER | 30 | 30 | - | 5 |

Research Focus

Compulsory courses

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|------------|---|----|----|-----|------------|
| SPAT0033-1 | <i>Astrophysics</i> - Pierre MAGAIN | 30 | 15 | - | 4,5 |
| SPAT0055-1 | <i>Atmosphere of Earth</i> - Jean-Claude GÉRARD | 30 | 15 | - | 5 |
| OCEA0047-1 | <i>Dynamic oceanography</i> - Jean-Marie BECKERS | 45 | - | - | 4,5 |
| SPAT0035-1 | <i>Space exploration</i> - Grégor RAUW | 30 | 10 | - | 4 |
| SPAT0036-1 | <i>Celestial mechanics and space trajectories</i> - Grégor RAUW | 20 | 10 | - | 3 |
| PHYS0931-1 | <i>Data processing</i> - Pierre MAGAIN | 15 | 30 | - | 3 |
| SPAT0037-1 | <i>Observing the Sky and Earth</i> - Jean SURDEJ - [5d FW] | 20 | 10 | [+] | 5 |
| SPAT0016-1 | <i>Space mission design, part 1</i> - Jean-Marc DEFISE | 10 | - | - | 1 |

Second Year

Compulsory course

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| SMEM0029-1 | <i>Final thesis</i> - COLLÉGIALITÉ | - | - | - | 27 |
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Optional courses

[...] Choose, with the approval of the Board of Studies, several courses totalling 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 | <i>Solar atmosphere, activity and Earth-Sun relations</i> - Frédéric CLETTE | 20 | 10 | - | 3 |
| SPAT0056-1 | <i>Planetary and exoplanetary atmospheres</i> - Jean-Claude GÉRARD, Denis GRODENT | 30 | 15 | - | 5 |
| SPAT0043-1 | <i>Small bodies in the solar system</i> - Emmanuel JEHIN | 15 | 5 | - | 2 |
| SPAT0044-1 | <i>Stellar Structure and evolution I</i> - Marc-Antoine DUPRET | 20 | 20 | - | 3 |
| SPAT0045-1 | <i>Stellar structure and evolution II</i> - Marc-Antoine DUPRET | 20 | 20 | - | 3 |
| SPAT0005-1 | <i>Stellar stability and asteroseismology</i> - Marc-Antoine DUPRET | 30 | 10 | - | 4 |
| SPAT0007-2 | <i>Variable stars</i> - Grégor RAUW | 20 | 10 | - | 3 |
| SPAT0006-1 | <i>Stellar atmospheres</i> - Grégor RAUW | 20 | 10 | - | 3 |
| SPAT0008-1 | <i>Interstellar Medium</i> - Damien HUTSEMEKERS, Yaël NAZÉ | 20 | 10 | - | 3 |
| GEOL0263-1 | <i>Astrobiology</i> - Philippe CLAEYS, Véronique DEHANT, Moreno GALLEN, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years) | 30 | 15 | - | 4 |
| SPAT0009-1 | <i>High-energy astrophysics</i> - Grégor RAUW | 25 | 5 | - | 4 |
| SPAT0010-1 | <i>Theoretical physical cosmology</i> - Christian BARBIER, Michel TYTGAT | 40 | - | - | 4 |
| SPAT0011-1 | <i>Extragalactic astrophysics</i> - Pierre MAGAIN | 20 | 10 | - | 3 |

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| SPAT0053-1 | (pas organisé en 2011-2012) <i>Tensorial analysis</i> | 15 | - | - | 2 |
| SPAT0012-1 | <i>General relativity I</i> - Yves DE ROP | 60 | - | - | 6 |
| SPAT0013-2 | (pas organisé en 2011-2012) <i>General relativity II</i> | 15 | - | - | 2 |
| SPAT0014-1 | <i>Introduction to time series analysis in astronomy</i> - Eric GOSSET | 20 | 5 | - | 3 |
| PHYS0125-3 | <i>Instrumental Optics II</i> - Serge HABRAKEN | 25 | 30 | - | 5 |
| SPAT0015-1 | <i>Signal acquisition and processing : application to embedded systems</i> - Christian SERVAIS | 10 | 30 | - | 4 |
| SPAT0016-2 | <i>Space mission design, part 2</i> - Jean-Marc DEFISE | - | 140 | - | 15 |
| AERO0018-3 | <i>Space Experiment Development</i> - Pierre ROCHUS | 30 | 30 | - | 5 |
| SPAT0017-1 | <i>Current questions and seminars</i> - Alberto BORGES, Jean-René CUDELL, Benoît HUBERT, Damien HUTSEMEKERS | - | 30 | - | 3 |
| SPAT0018-1 | <i>Evolution of ideas in Astronomy</i> - Yaël NAZÉ | 15 | - | - | 2 |
| SPAT0019-1 | <i>Special Relativity</i> - Jean SURDEJ | 15 | - | - | 2 |
| SPAT0020-2 | <i>Introduction to astrochemistry</i> - Michaël DE BECKER | 30 | 10 | - | 4 |
| SPAT0021-1 | <i>Introduction to astroparticles</i> - Joseph CUGNON | 20 | 10 | - | 3 |
| SPAT0022-1 | <i>Astroparticles</i> - Jean-René CUDELL | 30 | 15 | - | 4 |
| SPAT0046-1 | <i>Symmetries in Particle Astrophysics</i> - Floarea STANCU | 30 | - | - | 3 |
| SPAT0047-1 | <i>Quantum field theory</i> - Jean-René CUDELL | 30 | - | - | 3 |
| PHYS2012-1 | <i>Relativistic quantum mechanics and relativistic statistics</i> - Peter SCHLAGHECK | 20 | 5 | - | 3 |

Option Earth and Planetary Sciences

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

| | | | | | |
|------------|--|----|-----|-----|----|
| SPAT0023-1 | <i>Terrestrial magnetosphere and polar lights</i> - Benoît HUBERT | 30 | 10 | - | 4 |
| SPAT0024-2 | <i>Meteorology</i> - Louis FRANÇOIS | 40 | 20 | - | 6 |
| MECA0053-6 | <i>Geophysical fluid dynamics</i> - Jean-Marie BECKERS | 30 | - | - | 4 |
| OCEA0037-2 | <i>Oceanic and atmospheric waves</i> - Jean-Marie BECKERS | 30 | 10 | - | 4 |
| OCEA0003-1 | <i>Introduction to satellite oceanography</i> - Yves CORNET | 15 | 15 | - | 3 |
| OCEA0045-1 | <i>Statistical methods of analysis of oceanographic data</i> - Aïda ALVERA AZCARATE | 20 | 10 | - | 3 |
| GEOG0037-1 | <i>GNSS : Theory and applications</i> - René WARNANT | 35 | 15 | - | 5 |
| GEOG0038-1 | <i>Space geodesy</i> - René WARNANT - [1d FW] | 20 | - | [+] | 3 |
| SPAT0025-1 | <i>Environmental modelling</i> - Louis FRANÇOIS, Guy MUNHOVEN | 20 | 10 | - | 4 |
| SPAT0026-1 | <i>Paleoenvironment and evolution of the Earth system</i> - Louis FRANÇOIS | 30 | 10 | - | 4 |
| SPAT0027-3 | <i>Climate change and impacts</i> - Louis FRANÇOIS, Guy MUNHOVEN | 15 | 45 | - | 5 |
| SPAT0028-2 | <i>Planetary magnetospheres and aurorae</i> - Denis GRODENT | 20 | 10 | - | 3 |
| OCEA0046-1 | <i>Numerical modeling in geophysics</i> - Jean-Marie BECKERS | 20 | 30 | - | 5 |
| SPAT0041-2 | <i>Solar atmosphere, activity and Earth-Sun relations</i> - Frédéric CLETTE | 20 | 10 | - | 3 |
| SPAT0056-1 | <i>Planetary and exoplanetary atmospheres</i> - Jean-Claude GÉRARD, Denis GRODENT | 30 | 15 | - | 5 |
| SPAT0043-1 | <i>Small bodies in the solar system</i> - Emmanuel JEHIN | 15 | 5 | - | 2 |
| GEOL0263-1 | <i>Astrobiology</i> - Philippe CLAEYS, Véronique DEHANT, Moreno GALLEN, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE (Even years) | 30 | 15 | - | 4 |
| SPAT0014-1 | <i>Introduction to time series analysis in astronomy</i> - Eric GOSSET | 20 | 5 | - | 3 |
| PHYS0125-3 | <i>Instrumental Optics II</i> - Serge HABRAKEN | 25 | 30 | - | 5 |
| SPAT0015-1 | <i>Signal acquisition and processing : application to embedded systems</i> - Christian SERVAIS | 10 | 30 | - | 4 |
| SPAT0016-2 | <i>Space mission design, part 2</i> - Jean-Marc DEFISE | - | 140 | - | 15 |
| AERO0018-3 | <i>Space Experiment Development</i> - Pierre ROCHUS | 30 | 30 | - | 5 |
| SPAT0029-1 | <i>Space environment</i> - Denis GRODENT | 15 | 15 | - | 3 |
| SPAT0030-1 | <i>Internal Geophysics</i> - N... | 30 | - | - | 3 |
| SPAT0032-2 | <i>Teledetection</i> - Christian BARBIER | 30 | 30 | - | 5 |