

Block view of the study programme

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Block 1

Optional courses

Choisir, en accord avec le Jury, des cours pour un total de 60 crédits dans les listes proposées ci-dessous, dont au moins un des deux premiers cours de 5 des 6 listes proposées :

Space sciences : interdisciplinary courses

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|------------|--|----|----|----|---|---|
| SPAT0017-1 | <i>Seminars on topical issues</i> (english language) - JeanRené CUDELL, Benoît HUBERT, Damien HUTSEMEKERS, Charles TROUPIN | TA | - | 30 | - | 3 |
| SPAT0035-1 | <i>Space exploration</i> (english language) - Grégor RAUW | Q1 | 30 | 10 | - | 4 |
| SPAT0001-1 | <i>Plasma physics</i> (english language) - Benoît HUBERT | Q2 | 25 | 5 | - | 4 |
| SPAT0018-1 | <i>Ideas evolution in astronomy</i> - Yaël NAZÉ | Q1 | 14 | 6 | - | 2 |
| SPAT0036-1 | <i>Celestial mechanics and space trajectories</i> (english language) - Grégor RAUW | Q1 | 25 | 10 | - | 4 |
| SPAT0039-1 | <i>Spectroscopy in astrophysics and geophysics</i> (english language) - Jérôme LOICQ | Q1 | 20 | 10 | - | 3 |
| SPAT0040-1 | <i>Fluid mechanics</i> (english language) - Pierre DAUBY | Q1 | 20 | 10 | - | 4 |

Cosmology and astroparticle

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|------------|--|----|----|----|---|---|
| SPAT0021-1 | <i>Introduction to astroparticles</i> (english language) - JeanRené CUDELL | Q2 | 30 | - | - | 3 |
| SPAT0012-1 | (pas organisé en 2021-2022) <i>General relativity, Part 1: Introduction</i> | Q1 | 20 | - | - | 3 |
| SPAT0010-1 | <i>Theoretical physical cosmology</i> (english language) - Pierre MAGAIN Corequisite : SPAT0012-1 - Relativité générale SPAT0021-1 - Introduction to astroparticles | Q2 | 40 | - | - | 4 |
| SPAT0012-2 | (pas organisé en 2021-2022) <i>General relativity, Part 2: Mathematics methods</i> Corequisite : SPAT0012-1 - Relativité générale | Q1 | 20 | - | - | 2 |
| SPAT0012-3 | (pas organisé en 2021-2022) <i>General relativity, Part 3: supplement</i> Corequisite : SPAT0012-2 - Relativité générale | Q2 | 20 | - | - | 2 |
| SPAT0160-1 | <i>Particles ans astroparticles</i> (english language) - JeanRené CUDELL Corequisite : SPAT0162-1 - Quantum field theory | Q1 | 20 | 10 | - | 4 |
| SPAT0260-1 | <i>Particles and gravitation</i> (english language) - JeanRené CUDELL Corequisite : SPAT0012-2 - Relativité générale SPAT0012-1 - Relativité générale SPAT0162-1 - Quantum field theory | Q2 | 10 | 5 | - | 2 |
| SPAT0162-1 | <i>Quantum field theory</i> (english language) - JeanRené CUDELL Corequisite : SPAT0012-1 - Relativité générale | Q2 | 20 | 10 | - | 4 |
| PHYS2012-1 | <i>Relativistic quantum mechanics and relativistic statistics</i> - Peter SCHLAGHECK | Q1 | 20 | 5 | - | 3 |
| SPAT0075-1 | <i>Gravitational waves</i> (english language) - JeanRené CUDELL Corequisite : SPAT0012-3 - Relativité générale SPAT0012-2 - Relativité générale SPAT0012-1 - Relativité générale | Q1 | 10 | 5 | - | 2 |

Astrophysics

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|--|---|----|----|----|-----|---|
| SPAT0033-1 | <i>Astrophysics</i> (english language) - Pierre MAGAIN | Q1 | 35 | 15 | - | 5 |
| SPAT0044-1 | <i>Stellar structure and evolution I</i> (english language) - MarcAntoine DUPRET | Q1 | 35 | - | - | 3 |
| SPAT0005-1 | <i>Stellar stability and asteroseismology</i> (english language) - MarcAntoine DUPRET Corequisite : SPAT0040-1 - Fluid mechanics SPAT0044-1 - Stellar structure and evolution I | Q2 | 30 | 10 | - | 4 |
| SPAT0006-1 | <i>Stellar atmospheres</i> (english language) - Grégor RAUW Corequisite : SPAT0039-1 - Spectroscopy in astrophysics and geophysics | Q2 | 20 | 10 | - | 3 |
| SPAT0007-2 | <i>Variable stars</i> (english language) - Grégor RAUW | Q1 | 20 | 10 | - | 3 |
| SPAT0008-1 | <i>Interstellar medium</i> (english language) - Michaël DE BECKER, Valérie VAN GROOTEL | Q1 | 20 | 10 | - | 3 |
| SPAT0009-1 | <i>High-energy astrophysics</i> (english language) - Grégor RAUW | Q1 | 25 | 5 | - | 3 |
| SPAT0011-1 | <i>Extragalactic astrophysics</i> (english language) - Pierre MAGAIN Corequisite : SPAT0033-1 - Astrophysics | Q1 | 20 | 10 | - | 3 |
| SPAT0020-2 | <i>Astrochemistry</i> (english language) - Michaël DE BECKER | Q1 | 30 | 10 | - | 4 |
| SPAT0045-1 | <i>Stellar structure and evolution II</i> (english language) - MarcAntoine DUPRET Corequisite : SPAT0044-1 - Stellar structure and evolution I | Q2 | 20 | 20 | - | 3 |
| SPAT0069-1 | <i>Radio astrophysics</i> (english language) - Michaël DE BECKER | Q2 | 15 | 15 | - | 4 |
| Planetary science and planetary systems | | | | | | |
| SPAT0055-1 | <i>Atmosphere of the Earth</i> (english language) - Denis GRODENT | Q1 | 45 | - | - | 4 |
| SPAT0063-1 | <i>Introduction to exoplanetology</i> (english language) - Olivier ABSIL, Michaël GILLON Corequisite : SPAT0033-1 - Astrophysics | Q2 | 20 | 10 | - | 4 |
| SPAT0023-1 | <i>Terrestrial magnetosphere and polar lights</i> (english language) - Benoît HUBERT | Q2 | 30 | 10 | - | 4 |
| SPAT0028-2 | <i>Planetary magnetospheres and aurorae</i> (english language) - Bertrand BONFOND, Denis GRODENT | Q2 | 20 | 10 | - | 3 |
| SPAT0029-1 | <i>Space environment</i> (english language) - Denis GRODENT | Q1 | 15 | 15 | - | 3 |
| SPAT0043-1 | <i>The small bodies of the solar system</i> (english language) - Emmanuel JEHIN | Q2 | 15 | 5 | - | 2 |
| SPAT0056-1 | <i>Planetary and exoplanetary atmospheres</i> (english language) - Denis GRODENT Corequisite : SPAT0055-1 - Atmosphere of the Earth | Q2 | 30 | 15 | - | 5 |
| GEOL0263-1 | <i>Astrobiology</i> (english language) - Vincianne DEBAILLE, Véronique DEHANT, Emmanuelle JAVAUX, Yaël NAZÉ, Annick WILMOTTE | Q2 | 45 | - | - | 5 |
| GEOL0304-1 | <i>Introduction to neotectonics, seismology and physical volcanology</i> (english language) - Clara BRERETON, HansBalder HAVENITH - Suppl : Léna CAUCHIE - [2d FW] | Q1 | 25 | 15 | [+] | 5 |
| SPAT0066-1 | <i>Internal geophysics of the Earth and terrestrial bodies of the solar system</i> (english language) - Véronique DEHANT | Q1 | 25 | - | - | 2 |
| Climate, environment and oceanography | | | | | | |
| SPAT0027-3 | <i>Climate change and impacts</i> (english language) - Louis FRANÇOIS, | TA | 30 | 30 | - | 5 |

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| OCEA0071-1 | <i>Geophysical fluid dynamics - part 1</i> (english language) - JeanMarie BECKERS | Q2 | 30 | 15 | - | 6 |
| SPAT0024-2 | <i>Meteorology</i> - Part 1 - Louis FRANÇOIS - Part 2 - Louis FRANÇOIS | Q1 | | | | 6 |
| | | | 20 | 10 | - | |
| | | | 20 | 10 | - | |
| SPAT0025-1 | <i>Environmental modelling</i> (english language) - Louis FRANÇOIS, Guy MUNHOVEN | Q2 | 20 | 10 | - | 4 |
| SPAT0026-1 | <i>Paleoenvironment and evolution of the Earth system</i> (english language) - Louis FRANÇOIS | Q2 | 30 | 10 | - | 4 |
| SPAT0032-2 | <i>Remote sensing</i> (english language) - Christian BARBIER | Q1 | 30 | 30 | - | 6 |
| GEOG0037-1 | <i>Global Navigation Satellite Systems</i> - René WARNANT | Q1 | 40 | 15 | - | 5 |
| GEOG0038-1 | <i>Advanced GNSS</i> - René WARNANT Corequisite : GEOG0037-1 - Global Navigation Satellite Systems | Q1 | 25 | 30 | - | 5 |
| OCEA0045-1 | <i>Statistical methods of analysis of oceanographic data</i> (english language) - Aida ALVERA AZCARATE | Q1 | 20 | 10 | - | 3 |
| OCEA0087-1 | <i>Satellite oceanography</i> (english language) - Aida ALVERA AZCARATE | Q1 | 15 | 15 | - | 3 |
| OCEA0072-1 | <i>Geophysical fluid dynamics - part 2</i> (english language) - JeanMarie BECKERS Corequisite : OCEA0071-1 - Geophysical fluid dynamics - part 1 | Q1 | 30 | 15 | - | 5 |
| OCEA0081-1 | <i>Numerical Methods in Geophysics - Part 2</i> (english language) - JeanMarie BECKERS | Q1 | 15 | 30 | - | 5 |

Instrumentation and methods for space sciences

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|------------|--|----|----|----|-----|----------|
| SPAT0068-1 | <i>Astrophysical observations</i> (english language) - Emmanuel JEHIN - [5d FW] | Q2 | 15 | 15 | [+] | 6 |
| SPAT0002-1 | <i>Programming techniques, numerical methods and machine learning</i> (english language) - Dominique SLUSE | Q1 | 15 | 15 | - | 3 |
| PHYS0048-3 | <i>Coherent and incoherent optics, Instrumental optics I</i> (english language) - Serge HABRAKEN | Q1 | 20 | 15 | - | 4 |
| SPAT0014-1 | <i>Introduction to time series analysis</i> (english language) - N... | Q2 | 20 | 15 | - | 4 |
| SPAT0015-1 | <i>Signal acquisition and processing : application to embedded systems</i> - Christian SERVAIS (Even years) | Q2 | 10 | 30 | - | 4 |
| AERO0018-3 | <i>Space experiment development</i> (english language) - Denis GRODENT, Jérôme LOICQ, Jérôme LOICQ | Q2 | 26 | 26 | - | 5 |
| PHYS0125-3 | <i>Instrumental optics II</i> (english language) - Serge HABRAKEN Corequisite : PHYS0048-3 - Coherent and incoherent optics | Q2 | 25 | 15 | - | 4 |
| PHYS0931-1 | <i>Data processing</i> - Pierre MAGAIN | Q2 | 15 | 30 | - | 4 |
| SPAT0067-1 | <i>Atmospheric and adaptive optics</i> (english language) - Olivier ABSIL Corequisite : PHYS0048-3 - Coherent and incoherent optics | Q2 | 15 | 5 | - | 2 |
| SPAT0262-1 | <i>Gravitational wave data analysis with Python</i> (english language) - Maxime FAYS | Q2 | - | 15 | - | 2 |

Block 2

Compulsory courses

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|------------|------------------------------------|----|---|---|---|-----------|
| SMEM0029-1 | <i>Final thesis</i> - COLLÉGIALITÉ | TA | - | - | - | 15 |
|------------|------------------------------------|----|---|---|---|-----------|

Study programmes 2021-2022

Faculty of Sciences

Master in space sciences (120 ECTS)

SPAT0070-1 *Final thesis complement* - COLLÉGIALITÉ TA - - - 12

Optional courses

Choisir, en accord avec le Jury, un cours non déjà choisis de 3 crédits dans les listes proposées en Bloc 1

[...] In agreement with the jury, chose a course that hasn't already been chosen worth 3 credits from the lists offered in Block 1

Choose one focus from the following :

Research Focus

Choose courses totalling 30 ECTS out of the following :

[...] Choose courses not already chosen for a total of 30 credits from the ULiège Faculty of Science or Applied Science course programme (including the ULiège Master of Civil Engineering in Aerospace programme), from the list below and/or from another institution's course programme. These choices must be backed up by a coherent choice of curriculum, approved by the Jury

SSTG0043-1 *Placement* - N..., Yaël NAZÉ, Grégor RAUW TA - 140 - 10

Professional Focus

Compulsory courses

SSTG0052-1 *Internship in industry or agency* (english language) - N... TA - 70 - 5

SPAT0072-1 *Seminars on space activities* (english language) - Christian BARBIER Q1 30 - - 5

GEST3162-1 *Principles of management* (english language) - François PICHULT, Willem STANDAERT - [25h Proj.] Q1 30 - [+] 5

SPAT0073-1 *Space optics* (english language) - Jérôme LOICQ Q1 30 10 - 5

Optional courses

In agreement with the jury, chose courses that haven't already been chosen for a total of 10 credits from the list below:

SPAT0074-1 *Internship complement* (english language) - Michaël DE BECKER TA - 40 - 3

ELEN0008-1 *Principles of analog and digital telecommunications systems* - Marc VAN DROOGENBROECK Q2 26 26 - 5

AERO0018-3 *Space experiment development* (english language) - Denis GRODENT, Jérôme LOICQ, Jérôme LOICQ Q2 26 26 - 5

GEOG0037-1 *Global Navigation Satellite Systems* - René WARNANT Q1 40 15 - 5

SPAT0032-2 *Remote sensing* (english language) - Christian BARBIER Q1 30 30 - 6

[...] this list can be extended to courses of interest in the space sector included in the curriculum of other master's degrees:

Bloc d'aménagement du programme de l'année

Additional ECTS (max 15-60) Master in space sciences (120 ECTS)

Optional courses

The update course, worth a maximum of 60 credits, will be determined based on students' prior training.

[...] Between 15 and 60 ECTS of courses