

#### Cycle view of the study programme

B1 Or Th Pr Au Cr

Depending on your track record or your professional/research focus, some prerequisites/corequisites of your first year program might appear in bloc 2. You are therefore invited to go through the list of courses suggested in bloc 2 even if you enroll for the first time in this master program.

To complete their curriculum, students must earn or validate the 55 credits of the compulsory courses (including the master thesis and internship), 10 credits of a thematic, 25 credits of optional courses and 30 credits from the professional focus. Ideally, students enrolling in the master program should have acquired the skills and knowledge corresponding to the 40 credits in "Mechanics" offered as part of the bachelor program in engineering.

#### Compulsory courses within the focus (B1 : 20Cr)

AERO0025-1	<i>Satellite engineering</i> (english language) - Gaëtan KERSCHEN	B1	Q1	52	-	-	5
AERO0003-1	<i>Flight Dynamics and Control</i> (english language) - Christophe COLLETTE, Grigorios DIMITRIADIS <b>Corequisite :</b> AERO0001-1 - Aerodynamics AERO0036-1 - Spacecraft control	B1	Q2	26	26	-	5
AERO0014-1	<i>Aerospace propulsion</i> (english language) - Koen HILLEWAERT <b>Corequisite :</b> AERO0001-1 - Aerodynamics	B1	Q2	26	26	-	5
AERO0030-1	<i>Computational fluid dynamics</i> (english language) - Vincent TERRAPON - [10h Labo.]	B1	Q2	30	20	[+]	5

#### Optional courses within the focus (B1 : 10Cr)

Choose one course between : (B1 : 10Cr)

APRI0004-1	<i>Aeronautics design project</i> (english language) - Thomas ANDRIANNE, Ludovic NOELS - [10h Labo., 260h Proj., 5d FW] <b>Corequisite :</b> AERO0001-1 - Aerodynamics AERO0003-1 - Flight Dynamics and Control AERO0014-1 - Aerospace propulsion	B1	TA	30	-	[+]	10
APRI0011-1	<i>Space system design project</i> (english language) - Lionel JACQUES <b>Corequisite :</b> AERO0037-1 - Space optical instrumentation AERO0038-1 - Thermal analysis of space systems AERO0025-1 - Satellite engineering	B1	TA	-	-	-	10

#### Compulsory courses from the core curriculum (B1 : 20Cr, B2 : 35Cr)

MECA0462-2	<i>Materials selection</i> (english language) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW]	B1	Q1	26	26	[+]	5
MECA0029-1	<i>Theory of vibration</i> (english language) - Loïc SALLES - [30h Proj.] <b>Corequisite :</b> MECA0155-2 - Dynamique des systèmes mécaniques MECA0036-2 - Finite Element Method	B1	Q1	26	26	[+]	5
AERO0001-1	<i>Aerodynamics</i> (english language) - Thomas ANDRIANNE, Vincent TERRAPON - [2h Labo., 25h Proj.]	B1	Q1	27	25	[+]	5
AERO0036-1	<i>Spacecraft control</i> (english language) - Christophe COLLETTE - Suppl : Julien TALLINEAU	B1	Q2	26	26	-	5
ATFE0005-1	<i>Master thesis and internship</i> (english language) - <i>Master thesis</i> - Gaëtan KERSCHEN - [750h Proj.] - <i>Integration internship</i> - Gaëtan KERSCHEN	B2	TA	-	-	[+]	30
GEST3162-1	<i>Principles of management</i> (english language) - Thomas PIRSOUL, Willem STANDAERT - [25h Proj.]	B2	Q1	30	-	[+]	5

#### Optional courses from the core curriculum (B1 : 10Cr, B2 : 25Cr)

Choose a thematic between "Aeronautics" and "Space engineering". (B1 : 10Cr)

#### Aeronautics (B1 : 10Cr)

MECA0023-1	<i>Advanced solid mechanics</i> (english language) - JeanPhilippe PONTHOT - [30h Proj.]	B1	Q1	26	26	[+]	5
MECA0028-1	<i>Aeronautical structures</i> (english language) - Ludovic NOELS - [70h Proj.]	B1	Q2	30	20	[+]	5
	<b>Corequisite :</b> APRI0004-1 - Aeronautics design project						

#### Space engineering (B1 : 10Cr)

AERO0037-1	<i>Space optical instrumentation</i> (english language) - Denis GRODENT, Jérôme LOICQ - [1d FW]	B1	Q1	40	12	[+]	5
AERO0038-1	<i>Thermal analysis of space systems</i> (english language) - Lionel JACQUES	B1	Q2	-	-	-	5

Choose 25 credits from the list below: (B2 : 25Cr)

**The subjects MECA0025-3, MECA0155-2 and MECA0036-2 are corequisite to some compulsory courses of the master program. They must be taken as a priority, unless they were already taken as part of the bachelor in engineering, or unless the corresponding knowledge and skills have been acquired previously.**

MECA0025-3	<i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]	B2	Q2	26	26	[+]	5
MECA0155-2	<i>Dynamics of mechanical systems</i> - Loïc SALLES - [20h Proj.]	B2	Q1	26	26	[+]	5
MECA0036-2	<i>Finite Element Method</i> (english language) - JeanPhilippe PONTHOT - [40h Proj.]	B2	Q2	26	26	[+]	5

[...] With the agreement of the jury, choose 5 credits in any master program of the Faculty or from the UNIC course catalog.

[...] With the agreement of the President of the Jury, a maximum of 5 credits can be selected among the courses of the Master in Space Sciences

#### Aeronautics

AERO0032-1	<i>Aeroelasticity and experimental aerodynamics</i> (english language) - Thomas ANDRIANNE	B2	Q1	26	26	-	5
	<b>Prerequisite :</b> AERO0001-1 - Aerodynamics MECA0029-1 - Theory of vibration						
AERO0015-1	<i>Mechanical design of turbomachinery</i> (english language) - Loïc SALLES - [30h Proj.]	B2	Q1	26	26	[+]	5
	<b>Prerequisite :</b> MECA0029-1 - Theory of vibration						
MECA0502-1	<i>Mechanics of composites</i> (english language) - Michaël BRUYNEEL	B2	Q1	26	26	-	5
MECA0032-1	<i>Flow in turbomachines</i> (english language) - Koen HILLEWAERT - [60h Proj.]	B2	Q1	26	26	[+]	5
	<b>Prerequisite :</b> AERO0030-1 - Computational fluid dynamics AERO0001-1 - Aerodynamics						
AERO0004-1	<i>Turbulent Flows</i> (english language) - Vincent TERRAPON - [40h Proj.]	B2	Q1	26	26	[+]	5
AERO0033-1	<i>Aerothermodynamics of high-speed flows</i> (english language) - Koen HILLEWAERT, Thierry MAGIN - [1d FW]	B2	Q2	26	26	[+]	5
	<b>Prerequisite :</b> AERO0001-1 - Aerodynamics						
MECA0023-1	<i>Advanced solid mechanics</i> (english language) - JeanPhilippe PONTHOT - [30h Proj.]	B2	Q1	26	26	[+]	5

MECA0028-1 *Aeronautical structures* (english language) - Ludovic NOELS - [70h Proj.] B2 Q2 30 20 [+] 5

#### Space engineering

AERO0024-1 *Astrodynamics* (english language) - Gaëtan KERSCHEN - [20h Proj.] B2 Q1 26 26 [+] 5

SPAT0032-2 *Remote sensing* (english language) - François JONARD B2 Q1 20 20 - 5

ELEN0008-1 *Principles of analog and digital telecommunications systems* - Marc VAN DROOGENBROECK B2 Q2 26 26 - 5

PHYS0048-1 *Coherent and incoherent optics* (english language) B2 Q1 5  
 - *Coherent optics and lasers applications* - Serge HABRAKEN 10 15 -  
 - *Instrumental optics I* - Serge HABRAKEN 20 15 -

AERO0034-1 *ESA space technology course serie* (english language) - Gaëtan KERSCHEN B2 Q2 25 25 - 5

MECA0127-1 *Active structures* (english language) - Christophe COLLETTE - Suppl : Gonçalo RODRIGUES B2 Q1 26 26 - 5

SPAT0048-4 *Earth's atmospheric and space environment* (english language) B2 Q1 5  
 - *Introduction to atmospheric physics* - Denis GRODENT 37 - -  
 - *Space environment* - Denis GRODENT 15 - -

SPAT0033-1 *Astrophysics* (english language) - Michaël DE BECKER B2 Q1 35 10 - 5

AERO0037-1 *Space optical instrumentation* (english language) - Denis GRODENT, Jérôme LOICQ - [1d FW] B2 Q1 40 12 [+] 5

AERO0038-1 *Thermal analysis of space systems* (english language) - Lionel JACQUES B2 Q2 - - - 5

#### Computational mechanics

MECA0464-1 *Large deformation of solids* (english language) - Romain BOMAN, JeanPhilippe PONTHOT - [60h Proj.] B2 Q1 26 26 [+] 5

MECA0058-1 *Fracture mechanics, damage and fatigue* (english language) - Ludovic NOELS - [75h Proj.] B2 Q1 30 10 [+] 5

MECA0062-1 *Vibration testing and experimental modal analysis* (english language) - Loïc SALLES - [30h Proj.] B2 Q1 26 26 [+] 5

#### Prerequisite :

MECA0029-1 - Theory of vibration

INFO0939-1 *High performance scientific computing* (english language) - Christophe GEUZAINÉ - [20h Proj.] B2 Q1 30 15 [+] 5

MECA0027-1 *Structural and multidisciplinary optimization* (english language) - Pierre DUYSINX, Patricia TOSSINGS - Suppl : Michaël BRUYNEEL - [18h Proj.] B2 Q1 30 12 [+] 5

MECA0470-1 *New methods in computational mechanics and physics* (english language) - Maarten ARNST, Eric BÉCHET, Ludovic NOELS - [40h Proj.] B2 Q2 20 - [+] 5

AERO0035-1 *Nonlinear vibrations of aerospace structures* (english language) - Gaëtan KERSCHEN, Ghislain RAZE B2 Q1 26 26 - 5

MECA0031-2 *Kinematics and dynamics of mechanisms* (english language) - Olivier BRULS - [40h Proj.] B2 Q2 30 20 [+] 5

MECA0010-1 *Uncertainty quantification and stochastic modelling* (english language) - Maarten ARNST - [28h Proj.] B2 Q1 16 16 [+] 5

MECA0524-1 *CAD & Geometric Algorithms* - Eric BÉCHET - [60h Proj.] B2 Q1 20 20 [+] 5

[...] A maximum of 5 credits can be selected among the ISLV language courses organized in other Faculties or in the list below

LANG1957-1 *Dutch for Engineers, part 1* (dutch language) - Claudine COLIN B2 Q1 36 - - 3

### Master MSc. in Aerospace Engineering, professional focus in aerospace engineering

LANG2978-1	<i>Dutch for Engineers, part 2</i> (dutch language) - Claudine COLIN <b>Corequisite :</b> LANG1957-1 - Néerlandais pour l'ingénieur, partim 1	B2	Q2	24	-	-	2
LANG1958-1	<i>German for Engineers, Part 1</i> (german language) - Françoise CARL	B2	Q1	36	-	-	3
LANG2979-1	<i>German for Engineers, part 2</i> (german language) - Françoise CARL <b>Corequisite :</b> LANG1958-1 - Allemand pour l'ingénieur, partim 1	B2	Q2	24	-	-	2

### Bridging courses Master MSc. in Aerospace Engineering

*Notice :* The program of each candidate will be determined by the Jury according to his previous training. If a candidate does not master certain prerequisites, his program may include up to 60 credits of additional courses mainly from the list below :

#### Optional courses (B0 : 30Cr)

[...] Choose 1 to 30 credits from :

MECA0012-6	<i>Solid mechanics</i> - Laurent DUCHENE - [15h Proj.]	B0	Q2	26	26	[+]	5
MECA0002-1	<i>Applied Thermodynamics and Introduction to Heat Engines</i> - Vincent LEMORT	B0	Q1	26	26	-	5
MECA0445-2	<i>Heat transfer</i> (english language) - Pierre DEWALLEF, Vincent TERRAPON - [9h Proj.]	B0	Q2	28	24	[+]	5
MECA0025-3	<i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]	B0	Q2	26	26	[+]	5
MATH0006-3	<i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX	B0	Q1	20	20	-	4
MECA0001-2	<i>Mechanics of materials</i> - JeanFrançois DEMONCEAU, Laurent DUCHENE - [2h Labo., 12h Proj.]	B0	Q1	27	25	[+]	5
LANG0039-2	<i>English 2, English for Engineering</i> (english language) - Clara BRERETON, Véronique DOPPAGNE, Pascale DRIANNE, Stéphane GHIJSEN, Philippe JEUKENNE, Martin POLSON, David VANMANSHOVEN - [20h Proj.]	B0	TA	-	30	[+]	3
LANG0840-1	<i>French, S1 - 1er quadrimestre</i> - ISLV, Marielle MARÉCHAL	B0	Q1	-	-	-	5
SYST0002-2	<i>Introduction to signals and systems</i> - Guillaume DRION - [15h Proj.]	B0	Q2	26	26	[+]	5
MECA0444-1	<i>Mechanical design</i> - Eric BÉCHET, Pierre DUYSINX, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW]	B0	Q2	30	-	[+]	5
PHYS0904-4	<i>Physics of materials</i> - Luc COURARD, Anne MERTENS - [1d FW]	B0	Q2	26	26	[+]	5

[...] Choose a maximum of 8 off-list credits

### Bridging courses Master in aerospace engineering

*Notice :* The program of each candidate will be determined by the Jury according to his previous training. If a candidate does not master certain prerequisites, his program may include up to 60 credits of additional courses mainly from the list below :

#### Optional courses (B0 : 60Cr)

[...] Choose 31 to 60 credits from :

MECA0012-6	<i>Solid mechanics</i> - Laurent DUCHENE - [15h Proj.]	B0	Q2	26	26	[+]	5
MECA0002-1	<i>Applied Thermodynamics and Introduction to Heat Engines</i> - Vincent LEMORT	B0	Q1	26	26	-	5
MECA0445-2	<i>Heat transfer</i> (english language) - Pierre DEWALLEF, Vincent TERRAPON - [9h Proj.]	B0	Q2	28	24	[+]	5
MECA0025-3	<i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]	B0	Q2	26	26	[+]	5
MATH0006-3	<i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX	B0	Q1	20	20	-	4
MECA0001-2	<i>Mechanics of materials</i> - JeanFrançois DEMONCEAU, Laurent DUCHENE - [2h Labo., 12h Proj.]	B0	Q1	27	25	[+]	5
LANG0039-2	<i>English 2, English for Engineering</i> (english language) - Clara BRERETON, Véronique DOPPAGNE, Pascale DRIANNE, Stéphane GHIJSEN, Philippe JEUKENNE, Martin POLSON, David VANMANSHOVEN - [20h Proj.]	B0	TA	-	30	[+]	3
LANG0840-1	<i>French, S1 - 1er quadrimestre</i> - ISLV, Marielle MARÉCHAL	B0	Q1	-	-	-	5
SYST0002-2	<i>Introduction to signals and systems</i> - Guillaume DRION - [15h Proj.]	B0	Q2	26	26	[+]	5
MECA0444-1	<i>Mechanical design</i> - Eric BÉCHET, Pierre DUYSINX, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW]	B0	Q2	30	-	[+]	5
PHYS0904-4	<i>Physics of materials</i> - Luc COURARD, Anne MERTENS - [1d FW]	B0	Q2	26	26	[+]	5

[...] Choose a maximum of 8 off-list credits

#### Bridging courses Master in aerospace engineering (gen.)

MECA0012-6	<i>Solid mechanics</i> - Laurent DUCHENE - [15h Proj.]	B0	Q2	26	26	[+]	5
MECA0002-1	<i>Applied Thermodynamics and Introduction to Heat Engines</i> - Vincent LEMORT	B0	Q1	26	26	-	5
MECA0445-2	<i>Heat transfer</i> (english language) - Pierre DEWALLEF, Vincent TERRAPON - [9h Proj.]	B0	Q2	28	24	[+]	5
MECA0025-3	<i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]	B0	Q2	26	26	[+]	5
MATH0006-3	<i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX	B0	Q1	20	20	-	4
MECA0001-2	<i>Mechanics of materials</i> - JeanFrançois DEMONCEAU, Laurent DUCHENE - [2h Labo., 12h Proj.]	B0	Q1	27	25	[+]	5
LANG0039-2	<i>English 2, English for Engineering</i> (english language) - Clara BRERETON, Véronique DOPPAGNE, Pascale DRIANNE, Stéphane GHIJSEN, Philippe JEUKENNE, Martin POLSON, David VANMANSHOVEN - [20h Proj.]	B0	TA	-	30	[+]	3
LANG0840-1	<i>French, S1 - 1er quadrimestre</i> - ISLV, Marielle MARÉCHAL	B0	Q1	-	-	-	5
SYST0002-2	<i>Introduction to signals and systems</i> - Guillaume DRION - [15h Proj.]	B0	Q2	26	26	[+]	5
MECA0444-1	<i>Mechanical design</i> - Eric BÉCHET, Pierre DUYSINX, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW]	B0	Q2	30	-	[+]	5
PHYS0904-4	<i>Physics of materials</i> - Luc COURARD, Anne MERTENS - [1d FW]	B0	Q2	26	26	[+]	5