

#### Block view of the study programme

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#### Block 1

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

MECA0462-2	<i>Materials selection</i> (english language) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW]	Q1	26	26	[+]	5
MECA0029-1	<i>Theory of vibration</i> (english language) - Loic SALLES - [30h Proj.] <b>Corequisite :</b> MECA0036-2 - Finite Element Method MECA0155-2 - Dynamique des systèmes mécaniques	Q1	26	26	[+]	5
AERO0001-1	<i>Aerodynamics</i> (english language) - Thomas ANDRIANNE, Vincent TERRAPON - [2h Labo., 25h Proj.]	Q1	27	25	[+]	5
AERO0036-1	<i>Spacecraft control</i> (english language) - Christophe COLLETTE - Suppl : Julien TALLINEAU	Q2	26	26	-	5

#### Thematics

Choose a thematic between "Aeronautics" and "Space engineering".

##### Aeronautics

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

##### Space engineering

AERO0018-3	<i>Space experiment development</i> (english language) - Denis GRODENT, Jérôme LOICQ	Q2	26	26	-	5
PHYS0048-1	<i>Coherent and incoherent optics</i> (english language) - <i>Coherent optics and lasers applications</i> - Serge HABRAKEN - <i>Instrumental optics I</i> - Serge HABRAKEN	Q1				5
			10	15	-	
			20	15	-	

#### Single focus

##### Professional focus in aerospace engineering

##### Compulsory Courses

APRI0004-1	<i>Aerospace design project</i> (english language) - Grigorios DIMITRIADIS, Ludovic NOELS - [10h Labo., 260h Proj., 5d FW] <b>Corequisite :</b> AERO0003-1 - Flight Dynamics and Control AERO0001-1 - Aerodynamics AERO0014-1 - Aerospace propulsion	TA	30	-	[+]	10
AERO0025-1	<i>Satellite engineering</i> (english language) - Gaëtan KERSCHEN	Q1	52	-	-	5
AERO0003-1	<i>Flight Dynamics and Control</i> (english language) - Christophe COLLETTE, Grigorios DIMITRIADIS - Suppl : Adrien CROVATO <b>Corequisite :</b>	Q2	26	26	-	5

	AERO0036-1 - Spacecraft control AERO0001-1 - Aerodynamics						
AERO0014-1	<i>Aerospace propulsion</i> (english language) - Koen HILLEWAERT <b>Corequisite :</b> AERO0001-1 - Aerodynamics	Q2	26	26	-	5	
AERO0030-1	<i>Computational fluid dynamics</i> (english language) - Vincent TERRAPON - [10h Labo.]	Q2	30	20	[+]	5	

#### Block 2

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.

#### Compulsory Courses

ATFE0005-1	<i>Master thesis and internship</i> (english language) - <i>Master thesis</i> - Grigorios DIMITRIADIS - [750h Proj.] - <i>Integration internship</i> - Pierre DEWALLEF	TA					<b>30</b>
						[+]	
GEST3162-1	<i>Principles of management</i> (english language) - François PICHAULT, Willem STANDAERT - [25h Proj.]	Q1	30			[+]	<b>5</b>

#### Thematics

##### Optional courses

Choose 25 credits from the list below:

**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.]	Q2	26	26	[+]	<b>5</b>
MECA0155-2	<i>Dynamics of mechanical systems</i> - Loïc SALLES - [20h Proj.]	Q1	26	26	[+]	<b>5</b>
MECA0036-2	<i>Finite Element Method</i> (english language) - JeanPhilippe PONTHOT - [40h Proj.]	Q2	26	26	[+]	<b>5</b>

[...] 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, Grigorios DIMITRIADIS <b>Prerequisite :</b> MECA0029-1 - Theory of vibration AERO0001-1 - Aerodynamics	Q1	26	26	-	<b>5</b>
AERO0015-1	<i>Mechanical design of turbomachinery</i> (english language) - Loïc SALLES - [30h Proj.] <b>Prerequisite :</b> MECA0029-1 - Theory of vibration	Q1	26	26	[+]	<b>5</b>
MECA0502-1	<i>Mechanics of composites</i> (english language) - Michaël BRUYNEEL	Q1	26	26	-	<b>5</b>
MECA0032-1	<i>Flow in turbomachines</i> (english language) - Koen HILLEWAERT - [60h Proj.] <b>Prerequisite :</b> AERO0001-1 - Aerodynamics AERO0030-1 - Computational fluid dynamics	Q1	26	26	[+]	<b>5</b>
AERO0004-1	<i>Turbulent Flows</i> (english language) - Vincent TERRAPON - [40h Proj.]	Q1	26	26	[+]	<b>5</b>

AERO0033-1	<i>Aerothermodynamics of high-speed flows</i> (english language) - Grigorios DIMITRIADIS, Thierry MAGIN - [1d FW]	Q2	26	26	[+]	5
	<b>Prerequisite :</b> AERO0001-1 - Aerodynamics					
MECA0023-1	<i>Advanced solid mechanics</i> (english language) - JeanPhilippe PONTHOT - [30h Proj.]	Q1	26	26	[+]	5
MECA0028-1	<i>Aeronautical structures</i> (english language) - Ludovic NOELS - [70h Proj.]	Q2	30	20	[+]	5
<b>Space engineering</b>						
AERO0024-1	<i>Astrodynamics</i> (english language) - Gaëtan KERSCHEN - [20h Proj.]	Q1	26	26	[+]	5
SPAT0032-2	<i>Remote sensing</i> (english language) - François JONARD	Q1	20	20	-	5
AERO0026-1	(pas organisé en 2023-2024) <i>Lauch vehicles design and propulsion</i> (english language)	Q2	30	-	-	5
ELEN0008-1	<i>Principles of analog and digital telecommunications systems</i> - Marc VAN DROOGENBROECK	Q2	26	26	-	5
PHYS0048-1	<i>Coherent and incoherent optics</i> (english language) - <i>Coherent optics and lasers applications</i> - Serge HABRAKEN - <i>Instrumental optics I</i> - Serge HABRAKEN	Q1				5
			10	15	-	
			20	15	-	
AERO0034-1	<i>ESA space technology course serie</i> (english language) - Gaëtan KERSCHEN	Q2	25	25	-	5
MECA0127-1	<i>Active structures</i> (english language) - Christophe COLLETTE - Suppl : Grégory GONZALEZ RODRIGUEZ	Q1	26	26	-	5
SPAT0048-4	<i>Earth's atmospheric and space environment</i> (english language) - <i>Introduction to atmospheric physics</i> - Denis GRODENT - <i>Space environment</i> - Denis GRODENT	Q1				5
			37	-	-	
			15	-	-	
AERO0018-3	<i>Space experiment development</i> (english language) - Denis GRODENT, Jérôme LOICQ	Q2	26	26	-	5
SPAT0033-1	<i>Astrophysics</i> (english language) - Michaël DE BECKER	Q1	35	10	-	5
SPAT0073-1	<i>Space optics</i> (english language) - Jérôme LOICQ	Q1	30	10	-	5
<b>Computational mechanics</b>						
MECA0464-1	<i>Large deformation of solids</i> (english language) - Romain BOMAN, JeanPhilippe PONTHOT - [60h Proj.]	Q1	26	26	[+]	5
MECA0058-1	<i>Fracture mechanics, damage and fatigue</i> (english language) - Ludovic NOELS - [75h Proj.]	Q1	30	10	[+]	5
MECA0062-1	<i>Vibration testing and experimental modal analysis</i> (english language) - Loïc SALLES - Suppl : Mathieu BERTHA - [30h Proj.]	Q1	26	26	[+]	5
	<b>Prerequisite :</b> MECA0029-1 - Theory of vibration					
INFO0939-1	<i>High performance scientific computing</i> (english language) - Christophe GEUZAIN - [20h Proj.]	Q1	30	15	[+]	5
MECA0027-1	<i>Structural and multidisciplinary optimization</i> (english language) - Pierre DUYSINX, Patricia TOSSINGS - Suppl : Michaël BRUYNEEL - [18h Proj.]	Q1	30	12	[+]	5
MECA0470-1	<i>New methods in computational mechanics and physics</i> (english language) - Maarten ARNST, Eric BÉCHET, Ludovic NOELS - [40h Proj.]	Q2	20	-	[+]	5
AERO0035-1	<i>Nonlinear vibrations of aerospace structures</i> (english language) - Gaëtan KERSCHEN, Ghislain RAZE	Q1	26	26	-	5
MECA0031-2	<i>Kinematics and dynamics of mechanisms</i> (english language) - Olivier BRULS - [40h Proj.]	Q2	30	20	[+]	5
MECA0010-1	<i>Uncertainty quantification and stochastic modelling</i> (english language) - Maarten ARNST - [28h Proj.]	Q1	16	16	[+]	5

MECA0524-1 *CAD & Geometric Algorithms* - Eric BÉCHET - [60h Proj.] 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 Q1 36 - - 3

LANG2978-1 *Dutch for Engineers, part 2* (dutch language) - Claudine COLIN Q2 24 - - 2

**Corequisite :**

LANG1957-1 - Néerlandais pour l'ingénieur, partim 1

LANG1958-1 *German for Engineers, Part 1* (german language) - Françoise CARL Q1 36 - - 3

LANG2979-1 *German for Engineers, part 2* (german language) - Françoise CARL Q2 24 - - 2

**Corequisite :**

LANG1958-1 - Allemand pour l'ingénieur, partim 1

#### Bloc d'aménagement du programme de l'année

### Additional ECTS Master in aerospace engineering

#### Optional courses

Each student's programme will be determined by the jury depending on their prior training. If an applicant does not meet certain prerequisites, his or her programme may include up to 60 additional course credits essentially taken from the list below :

MECA0012-6 *Solid mechanics* - Laurent DUCHENE - [15h Proj.] Q2 26 26 [+] 5

MECA0002-1 *Applied Thermodynamics and Introduction to Heat Engines* - Vincent LEMORT Q1 26 26 - 5

MECA0445-2 *Heat transfer* (english language) - Pierre DEWALLEF, Vincent TERRAPON - [4h Labo., 9h Proj.] Q2 28 24 [+] 5

MECA0025-3 *Fluid Mechanics* - Eric DELHEZ - [30h Proj.] Q2 26 26 [+] 5

MATH0006-3 *Introduction to numerical analysis* (english language) - Quentin LOUVEAUX Q1 20 20 - 4

MECA0001-2 *Mechanics of materials* - JeanFrançois DEMONCEAU, Laurent DUCHENE - [2h Labo., 12h Proj.] Q1 27 25 [+] 5

LANG0039-2 *English 2, English for Engineering* (english language) - Véronique DOPPAGNE, Pascale DRIANNE, Philippe JEUKENNE, Martin POLSON, David VANMANSHOVEN - [20h Proj.] TA - 30 [+] 3

LANG0840-1 *French, S1 - 1er quadrimestre* - ISLV, Marielle MARÉCHAL Q1 - - - 5

SYST0002-2 *Introduction to signals and systems* - Guillaume DRION - [15h Proj.] Q1 26 26 [+] 5

MECA0444-1 *Mechanical design and machining* - Eric BÉCHET, Pierre DUYSINX, Marc NÉLIS, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW] Q2 30 - [+] 5

PHYS0904-4 *Physics of materials* - Luc COURARD, Anne MERTENS - [1d FW] Q2 26 26 [+] 5

[...] Choose maximum 8 credit to complete the study programme