Block view of the study programme

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Block 1

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

Within the framework of their Master in Mechanical Engineering, all students must follow or validate the 50 credits of joint training (including placement and final year dissertation), the 10 credits from the 'Computational Mechanics' list, the 30 credits from a choice of courses and the 30 credits from one of the three professional focuses.
Ideally, students studying for the master¿s degree will have acquired the competences and knowledge corresponding to the 40 credits of technical courses specific to the field of 'Mechanics', taught within the framework of the Bachelor in Civil Engineering.

Compulsory courses

MECA0029-1	*Theory of vibration* (english language) - Loïc SALLES - [30h Proj.] **Corequisite :** MECA0155-2 - Dynamique des systèmes mécaniques MECA0036-2 - Finite Element Method	Q1	26	26	[+]	**5**
MECA0462-2	*Materials selection* (english language) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW]	Q1	26	26	[+]	**5**
GEST3162-1	*Principles of management* (english language) - François PICHAULT, Willem STANDAERT - [25h Proj.]	Q1	30	-	[+]	**5**
MECA0018-2	*Manufacturing processes* (english language) - Yves MARCHAL - [15h Labo., 11h Proj., 0,5d FW]	Q2	30	-	[+]	**5**

Optional courses

Choose courses totalling 10 credits out of the following :

Students who have not followed the courses MECA0155-2 and MECA0036-2 from the "Mechanics" option of the bachelor in civil engineering programme or acquired the equivalent knowledge and skills have to choose in priority these two courses in their study programme ; theses courses are corequisites of compulsory courses of the master.

MECA0155-2	*Dynamics of mechanical systems* - Loïc SALLES - [20h Proj.]	Q1	26	26	[+]	**5**
MECA0036-2	*Finite Element Method* (english language) - JeanPhilippe PONTHOT - [40h Proj.] *Notice* : preferential choices for students of the "ADVANCED SHIP DESIGN"	Q2	26	26	[+]	**5**
MECA0027-1	*Structural and multidisciplinary optimization* (english language) - Pierre DUYSINX, Patricia TOSSINGS - Suppl : Michaël BRUYNEEL - [18h Proj.] **Corequisite :** MECA0036-2 - Finite Element Method MECA0155-2 - Dynamique des systèmes mécaniques *Notice* : preferential choices for students of the "ADVANCED SHIP DESIGN"	Q1	30	12	[+]	**5**
MECA0031-2	*Kinematics and dynamics of mechanisms* (english language) - Olivier BRULS - [40h Proj.] **Corequisite :** MECA0036-2 - Finite Element Method MECA0155-2 - Dynamique des systèmes mécaniques	Q2	30	20	[+]	**5**
MECA0023-1	*Advanced solid mechanics* (english language) - JeanPhilippe PONTHOT - [30h Proj.] **Corequisite :** MECA0036-2 - Finite Element Method MECA0155-2 - Dynamique des systèmes mécaniques	Q1	26	26	[+]	**5**
MECA0010-1	*Uncertainty quantification and stochastic modelling* (english language) -	Q1	16	16	[+]	**5**

Maarten ARNST - [28h Proj.]
Corequisite :
MECA0036-2 - Finite Element Method
MECA0155-2 - Dynamique des systèmes mécaniques

Choose one focus from the following :

Professional focus in mecatronics

APRI0005-3	*Mechanics and mechatronics integrated project* - Maarten ARNST, Eric BÉCHET, Olivier BRULS, Christophe COLLETTE, Pierre DUYSINX, Tristan GILET, Jean STUTO - [250h Proj., 5d FW] **Prerequisite :** MECA0444-1 - Conception mécanique et usinage **Corequisite :** MECA0018-2 - Manufacturing processes MECA0462-2 - Materials selection	TA	50	-	[+]	**15**

Choose courses totalling 15 ECTS out of the following :

MECA0504-1	*Industrial automation* - Olivier BRULS, Pierre DUYSINX - Suppl : Nathalie VETCOUR - [30h Labo.]	Q2	30	-	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.]	Q2	30	-	[+]	**5**
SYST0022-1	*Linear Systems Design* (english language) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]	Q2	26	26	[+]	**5**
SYST0020-1	*Introduction to microsystems and microtechnology* (english language) - Tristan GILET, JeanMichel REDOUTÉ - [4h Labo., 20h Proj.]	Q2	24	18	[+]	**5**

Professional focus in sustainable automotive engineering

MECA0525-1	*Performance and dynamics of vehicles* (english language) - Mustapha BELHABIB, Pierre DUYSINX - [4h Labo., 8h Proj., 1d FW]	Q2	30	15	[+]	**5**
MECA0041-1	*Internal combustion engine* (english language) - *Part 1 Fundamental aspects* - Marc NÉLIS - [1d FW, 15h Proj.] - *Part 2 Application to propulsion* - Marc NÉLIS - [10h Proj., 0,5d FW]	Q2 	 15 10	 15 10	 [+] [+]	**5**
APRI0010-1	*Integrated project of automotive design* - Maarten ARNST, Eric BÉCHET, Olivier BRULS, Christophe COLLETTE, Pierre DUYSINX, Tristan GILET, Jean STUTO - [250h Proj., 5d FW] **Prerequisite :** MECA0444-1 - Conception mécanique et usinage **Corequisite :** MECA0525-1 - Performance and dynamics of vehicles MECA0018-2 - Manufacturing processes MECA0025-3 - Mécanique des fluides MECA0029-1 - Theory of vibration MECA0041-1 - Internal combustion engine MECA0462-2 - Materials selection	TA	50	-	[+]	**15**

Choose courses totalling 5 ECTS from the following :

AERO0001-1	*Aerodynamics* (english language) - Thomas ANDRIANNE, Vincent TERRAPON - [2h Labo., 25h Proj.] **Corequisite :** MECA0025-3 - Mécanique des fluides	Q1	27	25	[+]	**5**
MECA0025-3	*Fluid Mechanics* - Eric DELHEZ - [30h Proj.]	Q2	26	26	[+]	**5**

Professional focus in Advanced ship design

Notice : The courses of this focus are exclusively reserved for students who follow the entire program "Advanced ship design" on the two years of master. The courses are however accessible to Erasmus

students.

APRI0009-1	*Integrated Design Project of Ships, Small Crafts & High Speed vessels* (english language) - Philippe RIGO - [150h Proj., 5d FW] **Corequisite :** CNAV0021-1 - Ship Theory : Statics and Dynamics MECA0018-2 - Manufacturing processes MECA0029-1 - Theory of vibration MECA0444-1 - Conception mécanique et usinage MECA0462-2 - Materials selection	TA	80	-	[+]	**15**
CNAV0021-1	*Ship Theory : Statics and Dynamics* (english language) - JeanCharles NAHON, Philippe RIGO	Q2	32	20	-	**5**
CNAV0014-3	*Ship and offshore structures and production (including 7 days technical visit)* (english language) - Luc COURARD, Philippe RIGO - [7d FW]	Q2	40	60	[+]	**7**
CNAV0022-1	*Ship Equipment and Propulsion Systems* (english language) - JeanCharles NAHON, Philippe RIGO - [1d FW]	Q2	20	20	[+]	**3**

Block 2

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

Compulsory courses

ATFE0013-1	*Master thesis and internship* - *Master thesis* - Tristan GILET - [750h Proj.] - *Professional integration internship* - Pierre DEWALLEF **Prerequisite :** MECA0155-2 - Dynamique des systèmes mécaniques MECA0036-2 - Finite Element Method	TA -	 -	 -	 [+]	**30**

Optional courses

Choose courses for a total of 30 credits from the Mechanical engineering, Mechatronics 2, Digital mechanics 2 and Vehicles and transportation lists or form the B1 programme:

Students who have not followed the MECA0444-1 course in the ¿Mechanics¿ option of the Civil Engineering programme or acquired the corresponding knowledge and skills must first incorporate this course into their programme; this course is a co-requisite for the compulsory courses for ¿Mechanical Engineering¿ and ¿Sustainable Automotive Engineering¿ focuses.

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

Language module

[...] Maximum 5 credits from the language courses programme organised by ISLV in other faculties or from the restricted list below

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

Mechanical engineering

MECA0473-1	*Metallic materials engineering* - Anne MERTENS	Q1	26	26	-	**5**

MECA0139-1	*Additive manufacturing and 3D printing* (english language) - Anne MERTENS	Q1	26	26	-	**5**
MECA0035-1	(pas organisé en 2023-2024) *Lubrification and tribology*	Q1	26	26	-	**5**
MECA0006-1	*Cooling and low-temperature heating systems* (english language) - Vincent LEMORT - [4h Proj.]	Q2	26	26	[+]	**5**
CHIM0699-2	*Life cycle assessment - Ecodesign* (english language) - Angélique LÉONARD	Q1	10	30	-	**3**
MECA0502-1	*Mechanics of composites* (english language) - Michaël BRUYNEEL	Q1	26	26	-	**5**
MECA0532-1	*Turbomachines* - Koen HILLEWAERT	Q1	26	26	-	**5**
Mecatronic 2						
ELEC0055-2	*Element of power Electronics, Part A* (english language) - Fabrice FREBEL	Q1	30	6	-	**3**
MECA0517-1	*Advanced industrial robotics* (english language) - Olivier BRULS - [10h Proj.]	Q2	30	20	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
INFO0064-2	*Embedded systems* (english language) - Bernard BOIGELOT	Q1	25	20	-	**3**
INFO2055-1	*Embedded systems project* (english language) - Bernard BOIGELOT - [60h Proj.]	Q2	-	-	[+]	**2**
GBIO0012-2	*Biomechanics* (english language) - Davide RUFFONI - [1d FW]	Q1	26	26	[+]	**5**
MECA0516-1	*Mechanical properties of biological and bioinspired materials* (english language) - Davide RUFFONI - [4h Labo.]	Q1	26	22	[+]	**5**
GBIO0022-1	*Biomimicry* (english language) - Philippe COMPÈRE, Tristan GILET, Davide RUFFONI - [45h Proj.]	TA	15	-	[+]	**5**
MECA0008-1	*Microfluidics* (english language) - Tristan GILET - [16h Labo., 14h Proj.]	Q2	22	8	[+]	**5**
PROT0430-3	*Biomedical robotics and active prostheses* (english language) - Olivier BRULS (Odd years)	Q1	15	10	-	**3**
MECA0127-1	*Active structures* (english language) - Christophe COLLETTE - Suppl : Grégory GONZALEZ RODRIGUEZ **Prerequisite :** SYST0022-1 - Linear Systems Design	Q1	26	26	-	**5**
Computational mechanics 2						
MECA0464-1	*Large deformation of solids* (english language) - Romain BOMAN, JeanPhilippe PONTHOT - [60h Proj.]	Q1	26	26	[+]	**5**
MECA0058-1	*Fracture mechanics, damage and fatigue* (english language) - Ludovic NOELS - [75h Proj.]	Q1	30	10	[+]	**5**
MECA0062-1	*Vibration testing and experimental modal analysis* (english language) - Loïc SALLES - Suppl : Mathieu BERTHA - [30h Proj.] **Prerequisite :** MECA0029-1 - Theory of vibration	Q1	26	26	[+]	**5**
MECA0524-1	*CAD & Geometric Algorithms* - Eric BÉCHET - [60h Proj.]	Q1	20	20	[+]	**5**
Vehicles and transport						
MECA0501-1	*Thermal Energy Management in vehicles* (english language) - Vincent LEMORT	Q1	26	26	-	**5**
MECA0063-1	*Vehicle architecture and components* (english language) - Emmanuel TROMME - [30h Proj.]	Q2	30	30	[+]	**5**
GCIV2066-1	*Fundamentals of transportation : transport planning* (english language) - Mario COOLS	Q1	15	15	-	**2**

MECA0527-1	*Electric, hybrid and fuel cell vehicles* (english language) - Pierre DUYSINX - [5h Labo., 15h Proj.]	Q1	30	10	[+]	**5**
[...]	Courses from B1					
[...]	Maximum 5 credits in the list of courses from other master's degrees in the faculty of Applied Sciences or du catalogue UNIC.					

Bloc d'aménagement du programme de l'année

Additional ECTS Master in mechanical 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 :

MECA0036-2	*Finite Element Method* (english language) - JeanPhilippe PONTHOT - [40h Proj.]	Q2	26	26	[+]	**5**
MECA0155-2	*Dynamics of mechanical systems* - Loïc SALLES - [20h Proj.]	Q1	26	26	[+]	**5**
MECA0012-6	*Solid mechanics* - Laurent DUCHENE - [15h Proj.]	Q2	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**
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**
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**
PHYS0904-4	*Physics of materials* - Luc COURARD, Anne MERTENS - [1d FW]	Q2	26	26	[+]	**5**
MECA0025-3	*Fluid Mechanics* - Eric DELHEZ - [30h Proj.]	Q2	26	26	[+]	**5**