Université de Liège

Study programmes 2007-2008
Faculty of Applied Sciences
civil engineering in electromechanics

First Year

Compulsory courses

DROI0724-2	*law and engineering* - Pascale LECOCQ	15	-	-	**2**
ELEC0053-1	*Electric circuits* - Patricia ROUSSEAUX	20	10	-	**3**
ELEC0052-1	*Analysis and Design of Electrical Measuring Systems* - Philippe VANDERBEMDEN	30	30	-	**5**
MECA0002-1	*Applied Thermodynamics and Introduction to Heat Engines* - Jean LEBRUN	30	30	-	**5**
MECA0007-1	*Fuel Use* - Albert GERMAIN, Angélique LÉONARD	20	-	-	**2,5**
MECA0011-1	*Fluid Mechanics: Basics* - André LEJEUNE	30	30	-	**5**
MECA0012-3	*Mechanics of materials* (english) - Serge CESCOTTO	45	30	-	**7**
MECA0013-1	*Machine design* - N...	30	30	-	**5**
MECA0018-1	*Industrial Forming Processes* - Jean-François DEBONGNIE	30	30	-	**5**
MECA0019-1	*Heat Transfers* - Michel HOGGE	20	20	-	**3**
MECA0030-1	*Dynamics of Mechanical Systems* - Jean-Claude GOLINVAL	30	30	-	**5**
MECA0134-1	*Engineering and Design Department Drawings and Computer-Aided Design* - Pierre BECKERS, N...	20	20	-	**3**
META0002-2	*Metallic Materials* - Jean-Pierre COHEUR	30	15	-	**4,5**
SYST0002-1	*Linear systems* - Rodolphe SEPULCHRE	30	30	-	**5**

aérospatiale

Second Year

Compulsory courses

AERO0001-2	*Aerodynamics, 30h Th, 30h Exc* - Jean-André ESSERS	30	20	-	**5,5**
AERO0003-1	*Flight mechanics and airplane performances* - Grigorios DIMITRIADIS	30	30	-	**5**
AERO0014-1	*Aeronautic and Space Propulsion* - Olivier LÉONARD	30	30	-	**5**
AERO0015-2	*Mechanical Design of Turbomachinery* - Jean-Claude GOLINVAL	30	20	-	**4,5**
AERO0016-3	*Aeroelasticity* - Grigorios DIMITRIADIS	20	-	-	**3,5**
AERO0019-2	*Integrated exercises* - COLLÉGIALITÉ - [5d FW]	-	70	[+]	**3,5**
GEST0106-1	*Elements of Corporate Management* - Pierre-Armand MICHEL	30	-	-	**4**
MECA0023-3	*Further Study of Solid Mechanics (Non-Linear Behaviour of Solids)* - Jean-Philippe PONTHOT	30	20	-	**4,5**
MECA0025-1	*Fluid Mechanics* - Jean-André ESSERS	30	30	-	**6**
MECA0028-2	*Aeronautical Structures* - Claude FLEURY	30	20	-	**4,5**
MECA0029-3	*Mechanical Vibrations* - Gaëtan KERSCHEN	30	20	-	**4,5**
MECA0036-2	*Finite Element Method* - Jean-Philippe PONTHOT	30	20	-	**4,5**
SYST0003-1	*Linear control systems* - Rodolphe SEPULCHRE	30	30	-	**5**

Third Year

Compulsory courses

[...]	One general education course, chosen from the University's course programme. This choice must be approved by the President of the Board of Studies.				
MECA0027-1	*Structure Optimization* - Claude FLEURY	30	30	-	**5**
ASTG0001-1	*Training in the workplace/ industrial internships* - N... - [40d Internship]	-	-	[+]	**8**

Notice : The compulsory training course (8 ECTS) lasts two months (effectively 40 days) and is taken responsibility for by a training course committee consisting of a superviser from the University of Liège academic staff, a superviser in industry, and a second member of the university's academic staff designated by the department (or its president). The committee will evaluate the training programme on the basis of a training report, an oral presentation and the comments of the superviser in industry.

ATFE0001-1	*Travail de fin d'études*	-	-	-	**20**

Optional courses

Choose courses totalling 24 ECTS from the following :

AERO0012-1	*Exterior Balistics and dynamics of space rockets* - Pierre BECKERS	15	15	-	**3**

AERO0018-1	*Space Experiment Development* - Pierre ROCHUS	15	15	-	**3**
AERO0020-1	*Theoretical training for piloting a private aircraft* - Claude FLEURY	30	-	-	**3**
ASTR0003-1	*Astromechanics Basics and Artificial Satellite Orbits* - Pierre ROCHUS	20	10	-	**3**
ASTR0004-2	*Astrophysics and Space Techniques* - Jean SURDEJ - [15h Pr., 5d Peda. Tr.]	30	-	[+]	**5**
CHIM0064-3	*Aerospace Materials (Composites)* - Jean-Marie LIÉGEOIS	30	-	-	**3**
ELEN0075-1	*Analog Electronics* - Benoît VANDERHEYDEN	30	30	-	**5**
ELEN0008-1	*Principles of analog and digital telecommunications systems* - Marc VAN DROOGENBROECK	30	30	-	**5**
INFO0026-2	*Computer Graphics* - Pierre BECKERS	15	15	-	**3**
MECA0004-1	*Vehicle performance and behaviour* - Pierre DUYSINX	30	30	-	**5**
MECA0015-1	*Hydraulic Machines* - Olivier LÉONARD	30	30	-	**5**
MECA0031-2	*Kinematics and Dynamics of Mechanisms* - Olivier BRULS	30	30	-	**5**
MECA0032-1	*Flow in Turbomachines* - Olivier LÉONARD	30	30	-	**5**
MECA0058-1	*Fracture Mechanics* - Laurent STAINIER	30	30	-	**5**
MECA0062-1	*Vibration Testing and Experimental Modal Analysis* - Jean-Claude GOLINVAL	30	30	-	**5**
MECA0084-1	*Random Vibrations and Fourier Analysis*	30	30	-	**5**
MECA0105-1	*Combustion in Rocket Engines* - Philippe NGENDAKUMANA	15	15	-	**3**
MECA0127-1	*Active Structures* - André PREUMONT	30	30	-	**5**
META0016-1	*Metallic Materials for Aerospace Applications* - Jacqueline LECOMTE#BECKERS	20	10	-	**3**
[...]	Courses totalling a maximum of 5 ECTS chosen from the Electromechanics Study Path courses or from the list of Electromechanics Study Path option courses.				

Cours à option communs à toutes les filières d'électomécanique

ASTR0003-2	*Astromechanics Basics and Artificial Satellite Orbits* - Pierre ROCHUS	20	20	-	**5**
CHIM0064-2	*Aerospace Materials (Composites)* - Jean-Marie LIÉGEOIS	20	-	-	**2,5**
ESHY0019-1	*Applied Meteorology* - N...	15	-	-	**2,5**
MATH0024-1	*Further Study of Digital Analysis (Equations with Partial Derivatives)* - Jean-André ESSERS	30	30	-	**5**
MECA0016-1	*Use of Means of Transport* - Jean MARCHAL	5	-	-	**2**
MECA0474-2	*CFAO en mécanique* - Pierre BECKERS	15	15	-	**2,5**
MECA0059-1	*Optimization Methods for Mechanical Constructions* - Jacques RONDAL	10	20	-	**2,5**
MECA0083-1	*Fluid/Structure Interaction* - Grigorios DIMITRIADIS	15	15	-	**2,5**
MECA0131-1	*Theory and Advanced Applications of Roller Bearings* - Jean-Luc BOZET	20	10	-	**2,5**
MECA0135-1	*Heating and Air Conditioning Equipment Gauging and Energy Management* - Jean-Pascal BOURDOUXHE	15	15	-	**2,5**
GEST1069-1	*Introduction to entrepreneurship* - Bernard SURLEMONT	30	-	-	**2,5**
ECON0878-1	*Microeconomy applied to the engineering science* - Jean-Pierre HANSEN	30	-	-	**2,5**
ECON0099-1	*Industrial strategy: economic case analysis* - Jean-Pierre HANSEN	30	-	-	**2,5**

énergétique

Second Year

Compulsory courses

GEST0106-1	*Elements of Corporate Management* - Pierre-Armand MICHEL	30	-	-	**4**
ELEC0431-1	*Electromagnetic energy transformation* - Christophe GEUZAINE	30	30	-	**5,5**
ELEN0075-1	*Analog Electronics* - Benoît VANDERHEYDEN	30	30	-	**5,5**
MECA0006-1	*Thermal Machines and Systems* - Jean LEBRUN	30	30	-	**5,5**
MECA0015-1	*Hydraulic Machines* - Olivier LÉONARD	30	30	-	**5,5**
MECA0024-1	*Structure Calculation (Finite Elements and Other Digital Methods)* - Jean-Philippe PONTHOT	30	30	-	**5,5**
MECA0033-1	*Heat and Material Transfer Modelling* - Michel HOGGE	30	30	-	**5,5**
MECA0037-1	*Centrales thermiques et cogénération* - Philippe MATHIEU	30	30	-	**6**
MECA0041-1	*Internal Combustion Engines* - Philippe NGENDAKUMANA	30	30	-	**6**
MECA0045-1	*Thermofluid Quantity Measurement* - Philippe NGENDAKUMANA	30	30	-	**5,5**
SYST0003-1	*Linear control systems* - Rodolphe SEPULCHRE	30	30	-	**5,5**

Third Year

Compulsory courses

[...]	One general education course, chosen from the University's course programme. This				

	choice must be approved by the President of the Board of Studies.				
ASTG0004-1	*Stage industriel* - [40d Internship]	-	-	[+]	**8**
	Notice : Two months, effectively 40 days.				
ATFE0001-1	*Travail de fin d'études*	-	-	-	**20**

Optional courses

Choose courses totalling 30 ECTS from the following :

CHIM0071-1	*Reduction of pollutants during combustion* - Albert GERMAIN, Angélique LÉONARD	15	15	-	**3**
ELEC0016-1	*Electric Energy Networks* - Jean-Louis LILIEN	30	30	-	**5**
GENU0018-1	*Nuclear Engineering and Nuclear Power Plant Technology* - Philippe MATHIEU	15	15	-	**3**
MECA0034-1	*Rational use of energy , air conditioning in buildings a* - Jean LEBRUN	30	30	-	**5**
MECA0034-3	*Rational use of energy , air conditioning in buildings a (partim)* - Jean LEBRUN	15	15	-	**2,5**
MECA0447-1	*Heat exchangers, constructive and fundamental aspects* - Philippe NGENDAKUMANA	15	15	-	**2,5**
MECA0046-2	*Heat exchangers, Heat exchangers networks and ra* - Georges HEYEN	15	15	-	**2,5**
MECA0066-1	*Turbine engines using compressible fluids, users' perspective* - Olivier LÉONARD	15	15	-	**2,5**
MECA0066-2	*Turbine engines using compressible fluids, developers' perspective* - Olivier LÉONARD	15	15	-	**2,5**
MECA0096-1	*Hydroelectric Power Plants and Economic Aspects* - André LEJEUNE - [2d FW]	15	-	[+]	**3**
MECA0099-1	*Vehicle Energy Management* - Pierre DUYSINX	30	30	-	**5**
MECA0099-2	*Vehicle Energy Management (partim)* - Pierre DUYSINX	15	15	-	**2,5**
MECA0124-1	*Combustion Modelling* - Philippe NGENDAKUMANA	30	30	-	**5**
MECA0450-1	*Renewable energies* - Philippe MATHIEU	30	30	-	**5**
META0034-1	*Metallic Material Behaviour in Energy Systems* - Jacqueline LECOMTE#BECKERS	15	15	-	**3**

génie mécanique

Second Year

Compulsory courses

GEST0106-1	*Elements of Corporate Management* - Pierre-Armand MICHEL	30	-	-	**4**
ELEC0431-1	*Electromagnetic energy transformation* - Christophe GEUZAINE	30	30	-	**5**
ELEN0075-1	*Analog Electronics* - Benoît VANDERHEYDEN	30	30	-	**5**
MECA0004-1	*Vehicle performance and behaviour* - Pierre DUYSINX	30	30	-	**5**
MECA0006-1	*Thermal Machines and Systems* - Jean LEBRUN	30	30	-	**5**
MECA0015-1	*Hydraulic Machines* - Olivier LÉONARD	30	30	-	**5**
MECA0024-1	*Structure Calculation (Finite Elements and Other Digital Methods)* - Jean-Philippe PONTHOT	30	30	-	**6**
MECA0475-2	*Conception intégrée et projet intégré* - Jean-Luc BOZET	30	70	-	**9**
MECA0069-1	*Series Production Methods* - Jean-François DEBONGNIE	30	30	-	**5**
MECA0120-1	*Hydraulic and pneumatic systems* - Liviu MASALAR	30	30	-	**6**
SYST0003-1	*Linear control systems* - Rodolphe SEPULCHRE	30	30	-	**5**

The 70h Practical Work for the course MECA0049-1 and the 30h Practical Work for the course MECA120-1 are linked within the framework of an integrated multidisciplinary project : *(Partial) conception and production of systems and/or car mechanical sub-assemblies.*

Third Year

Compulsory courses

[...]	One General Education course, chosen from the University programme, and approved by the President of the Board of Studies.				
MECA0035-1	*Ttribology I (lubrication science)* - Jean-Luc BOZET	30	30	-	**5**
MECA0038-1	*Measurement uncertainties and dimensional metrology* - Liviu MASALAR	30	30	-	**5**
ASTG0005-1	*Stage* - [40d Internship]	-	-	[+]	**8**

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A brief report will be produced, based on a precise framework, and will be orally defended in public. The report and the defence will be graded by a group consisting of the training course committee and one of the following three :

* *The department's President of the Board of Studies,*
* *The 3rd year jury President, or*
* *the 3rd year jury secretary.*

If the training course approaches areas looked at in the End of Study work project, it must nonetheless be clearly distinct and will be evaluated on the basis of a separate report and defence.
With the approval of the President of the Board of Studies the training programme by attending a university abroad on a SOCRATES type stay.

ATFE0001-1	*Travail de fin d'études*	-	-	-	**20**

Optional courses

Choose courses totalling 20 ECTS from the following :

CHIM0010-1	*Knowledge of Non-Metallic Materials* - Jean-Marie RIGO	30	-	-	**2,5**
MECA0051-3	*Total Quality Management* - Liviu MASALAR	15	30	-	**5**
MECA0063-1	*Vehicle Architecture* - Pierre DUYSINX	30	30	-	**5**
MECA0067-1	*Special Technology Issues* - Jean-François DEBONGNIE	30	30	-	**5**
MECA0068-2	*Numerical controlled machine-tools and flexible manufacturing* - Liviu MASALAR	15	15	-	**2,5**
MECA0087-1	*Tribology II (Dry Friction, Wear, Seizing)* - Jean-Luc BOZET	15	15	-	**2,5**
MECA0111-1	*Plastic Materials in Mechanics* - Jean-Marie RIGO	20	10	-	**2,5**
MECA0117-1	*Finite Element Method II* - Michel HOGGE	15	15	-	**2,5**
MECA0132-4	*Applications of welding techniques to mechanical constructions* - N...	30	30	-	**5**
META0041-1	*Special Metallic Materials* - Jacqueline LECOMTE#BECKERS	20	10	-	**2,5**
[...]	Courses totalling a maximum of 5 ECTS, chosen from the Faculty programme, and approved by the President of the Board of Studies.				

mécatronique - productique

Second Year

Compulsory courses

GEST0106-1	*Elements of Corporate Management* - Pierre-Armand MICHEL	30	-	-	**4**
ELEC0431-1	*Electromagnetic energy transformation* - Christophe GEUZAINE	30	30	-	**5**
ELEN0075-1	*Analog Electronics* - Benoît VANDERHEYDEN	30	30	-	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* - Philippe VANDERBEMDEN	30	30	-	**5**
MECA0024-1	*Structure Calculation (Finite Elements and Other Digital Methods)* - Jean-Philippe PONTHOT	30	30	-	**6**
MECA0154-1	*Special issues of sizing* - N...	30	30	-	**5**
MECA0004-1	*Vehicle performance and behaviour* - Pierre DUYSINX	30	30	-	**5**
MECA0120-1	*Hydraulic and pneumatic systems* - Liviu MASALAR	30	30	-	**6**
SYST0003-1	*Linear control systems* - Rodolphe SEPULCHRE	30	30	-	**5**
SYST0015-1	*Production Automation and Robotization. Theoretical Basics and Project*				**9**
INFO0063-1	*Object-Oriented Software Engineering* - Bernard BOIGELOT	30	30	-	**5**

The 30h Practical Work for the course MECA0120-1 and the 90h Practical Work for the course SYST0015-1 are linked within the framework of an integrated multidisciplinary project "Conception, (partial) production and automisation of full size robotised production flexible units".

Third Year

Compulsory courses

LOGI0001-1	*Supply Chain Management* (english) - Yasemin ARDA	45	-	-	**4,5**
ELEC0055-1	*Electronic systems of control mecanism* - Christophe GEUZAINE - Suppl : Paul BLEUS	30	30	-	**5**
MECA0051-3	*Total Quality Management* - Liviu MASALAR	15	30	-	**5**
ASTG0006-1	*Stage* - [40d Internship]	-	-	[+]	**8**

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Liège academic staff, a superviser ifrom the world of socio-economics, and a second member of the university's academic staff designated by the department (or its president).
A brief report will be produced, based on a precise framework, and will be orally defended in public.
The report and the defence will be graded by a group consisting of the training course committee and one of the following three :

* *The department's President of the Board of Studies,*
* *The 3rd year jury President, or*
* *the 3rd year jury secretary.*

If the training course approaches areas looked at in the End of Study work project, it must nonetheless be clearly distinct and will be evaluated on the basis of a separate report and defence.
With the approval of the President of the Board of Studies the training programme by attending a university abroad on a SOCRATES type stay.

ATFE0001-1	*Travail de fin d'études*	-	-	-	**20**

Optional courses

Choose courses totalling 17.5 ECTS from the following :

ELEN0043-1	*Application of Robotic Vision* - Christian LAURENT	15	15	-	**2,5**
GEST0366-1	*Advanced Operations Research* (english) - Yves CRAMA	45	-	-	**5**
INFO0058-1	*Introduction to Artificial Intelligence* - Pascal GRIBOMONT	15	15	-	**2,5**
MECA0015-1	*Hydraulic Machines* - Olivier LÉONARD	30	30	-	**5**
MECA0017-1	*Control system for land vehicles* - Pierre DUYSINX	30	30	-	**5**
MECA0017-2	*Control system for land vehicles (partim: vehicle dynamics)* - Pierre DUYSINX	15	15	-	**2,5**
MECA0038-1	*Measurement uncertainties and dimensional metrology* - Liviu MASALAR	30	30	-	**5**
MECA0038-2	*Measurement uncertainties and dimensional metrology* - Liviu MASALAR	15	15	-	**2,5**
MECA0063-1	*Vehicle Architecture* - Pierre DUYSINX	30	30	-	**5**
MECA0068-2	*Numerical controlled machine-tools and flexible manufacturing* - Liviu MASALAR	15	15	-	**2,5**
MECA0069-1	*Series Production Methods* - Jean-François DEBONGNIE	30	30	-	**5**
MECA0089-1	*Notions of robotics (mechanical aspects)* - Pierre DUYSINX	15	15	-	**2,5**
MECA0460-1	*Introduction to safety and health at work on machines-tools. Risk analysis* - Liviu MASALAR	15	15	-	**3**

Les cours au choix peuvent être choisis dans la liste des cours de toutes les orientations ingénieur civil électromécanicien.
[...] Avec l'accord du Président du jury de cycle, l'étudiant peut choisir des cours pour un maximum de 10 ECTS en-dehors de la liste des options préferentielles.

Notice : Ce choix doit être justifié par l'intérêt de ces enseignements pour le stage et/ou pour le travail de fin d'études.

métallurgie et science des matériaux

Second Year

Le programme de la 2e EMMET est composé de quatre modules obligatoires :

Compulsory courses

Module Non technical education					
GEST0106-1	*Elements of Corporate Management* - Pierre-Armand MICHEL	30	-	-	**4,5**
Module General Education in Electromechanics					
ELEC0431-1	*Electromagnetic energy transformation* - Christophe GEUZAINE	30	30	-	**5,5**
MECA0033-1	*Heat and Material Transfer Modelling* - Michel HOGGE	30	30	-	**5,5**
Module: General Education in Metallurgy/Materials					
CHIM0076-1	*Polymers and Composites* - Jean-Marie LIÉGEOIS	30	20	-	**5**
META0001-1	*General Metallurgy* - Jean-Pierre COHEUR	30	20	-	**5**
META0003-1	*Metal Physics* - Adrien MAGNÉE	30	30	-	**5,5**
META0038-1	*Theoretical Structural Metallurgy* - Adrien MAGNÉE	15	15	-	**3**
MECA0461-1	*Tribologie : aspects fondamentaux et mécanique* - Adrien MAGNÉE	20	20	-	**4**
Module science des matériaux					
CHIM0015-2	*Analytical chemistry II, physical methods* - Bernard GILBERT	30	10	-	**5**
GEOL0081-1	*Microscopic Image Analysis* - Eric PIRARD	15	15	-	**3**
MECA0022-1	*Continuum Thermomechanics* - Michel HOGGE	30	30	-	**5,5**

MECA0023-2	*Further Study of Solid Mechanics (Non-Linear Behaviour of Solids)* - Jean-Philippe PONTHOT	30	30	-	**5,5**
PHYS0234-2	*Introduction to fractals and chaos* - Marcel AUSLOOS	15	15	-	**3**

Optional courses

Les cours de "cours à option communs à toutes les filières d'électomécanique"

Third Year

Compulsory courses

Module Non technical education

[...]	One or more compulsory General Education course, totalling 4 ECTS, chosen from the University programme, and approved by the President of the Board of Studies.				

Module General Education in Mettalurgy/Materials

CHIM0223-1	*General inorganic chemistry : glasses, characterisation of non-crystalline solids.* - André RULMONT	15	-	-	**2**
CHIM0248-1	*Advanced ceramic materials : synthesis, characterization and use* - Rudi CLOOTS	15	-	-	**2**
META0008-1	*Selection of industrial materials* - Adrien MAGNÉE	20	20	-	**3**
META0013-1	*Forming Theory (Including Powder Metallurgy) and Applications to Rolling* - Jean-Pierre COHEUR	30	80	-	**6,5**
GEOL0276-1	*Traitement et valorisation des déchets* - Stoyan GAYDARDZHIEV	15	15	-	**2,5**
ATFE0001-1	*Travail de fin d'études*	-	-	-	**20**

Optional courses

Choose one module from :

Module C : The Structure of materials

MECA0091-1	*Material Secondary Forming Process Modelling* - Michel HOGGE	15	15	-	**2,5**
MECA0139-1	*Rapid Prototyping* - Thierry DORMAL	30	-	-	**2,5**
META0014-1	*Post-Rolling Treatment* - Jean-Pierre COHEUR	30	20	-	**4,5**
META0027-1	*Metal and Alloy Solidification* - Jacqueline LECOMTE#BECKERS	15	15	-	**2,5**

Module D : Using Materials

GCIV0184-2	*Building Materials* - Luc COURARD	30	30	-	**4,5**
META0034-1	*Metallic Material Behaviour in Energy Systems* - Jacqueline LECOMTE#BECKERS	15	15	-	**2,5**
META0040-1	*Modern Microscopic Analysis Techniques in Material Sciences* - Jacqueline LECOMTE#BECKERS	15	15	-	**2,5**
META0300-1	*Electrochemistry Applications to Material Industry* - Jean-Luc DELPLANCKE	20	10	-	**2,5**

Avec l'autorisation du Président du Conseil des études le étudiants pourront remplacer un cours de ces modules,

* par un cours de l'autre module.
* par un cours de la liste des options préférentielles ci-dessous.

Preferential options

META0021-1	*Further Study of Steel Industry* - Jean-Pierre COHEUR	30	-	-	**2,5**
META0030-1	*Nuclear Materials I* (english) - Jacqueline LECOMTE#BECKERS	15	15	-	**2,5**
META0032-1	*Metallic Material Surface Treatments and Tribomechanical Damage* - Adrien MAGNÉE	15	15	-	**2,5**
META0034-1	*Metallic Material Behaviour in Energy Systems* - Jacqueline LECOMTE#BECKERS	15	15	-	**2,5**
META0035-1	*Metallic Material Corrosion* - Jacqueline LECOMTE#BECKERS	20	10	-	**2,5**
META0036-1	*Advanced Metallic Materials* - Jacqueline LECOMTE#BECKERS	20	10	-	**2,5**

Choose an industrial training programme of 8 weeks (effectively 40 days) or, with the approval of the President of the Board of Studies, choose an equivalent volume of courses (8 ECTS) which have not already been taken from the following :

ASTG0007-1	*Stage industriel* - [40d Internship]	-	-	[+]	**8**
[...]	Courses from "Module C : mise à forme des matériaux"				
[...]	Courses from "Module D : utilisation des matériaux"				
[...]	Courses from "Options préférentielles"				

[...] Courses from "Cours à option communs à toutes les filières d'électomécanique"