Programme des cours 2015-2016

Faculté des Sciences Appliquées

Master en ingénieur civil électricien, à finalité

Vue cycle du programme des cours

		Bl	Or	Th	Pr	Au	Cr
Compulsory courses (B1 : 35Cr, B2 : 30Cr)							
SYST0003-1	*Linear control systems* (anglais) - Guillaume DRION - [6h Labo.]	B1	Q1	30	30	[+]	**5**
INFO0062-1	*Object-oriented programming* (anglais) - Bernard BOIGELOT - [20h Proj.]	B1	Q2	30	24	[+]	**5**
ELEC0055-2	*Electronic control systems* (anglais) - Fabrice FREBEL, Christophe GEUZAINE	B1	Q1	30	6	-	**3**
INFO0064-2	*Embedded systems* (anglais) - Bernard BOIGELOT **Corequis :** APRI0007-1 - Major project in electronics (including fundamentals of project management)	B1	Q1	25	20	-	**3**
ELEN0017-1	*Analysis and Design of Telecommunications Systems* (anglais) - Marc VAN DROOGENBROECK	B1	Q1	30	30	-	**5**
ELEN0037-1	*Microelectronics and IC design* (anglais) - Michael KRAFT - [40h Proj.]	B1	Q2	30	20	[+]	**5**
APRI0007-1	*Major project in electronics (including fundamentals of project management)* (anglais) - Marc BIRON, Bernard BOIGELOT, Guillaume DRION, Fabrice FREBEL, Christophe GEUZAINE - [80h Proj.] **Corequis :** ELEC0055-2 - Electronic control systems SYST0003-1 - Linear control systems INFO0064-2 - Embedded systems	B1	TA	20	-	[+]	**9**
GEST3162-1	*Principles of management* (anglais) - Michael GHILISSEN, François PICHAULT, Thierry PIRONET, Didier VAN CAILLIE	B2	Q1	25	25	-	**5**
ATFE0014-1	*Master thesis* - COLLÉGIALITÉ - [750h Proj.]	B2	TA	-	-	[+]	**25**
Optional courses (B1 : 25Cr, B2 : 30Cr)							
Choose one of the following options : (B1 : 25Cr)							
	Remarque : students who, for their bachelor's degree, took one or more of courses of this program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.						
Signal processing and control 1 (B1 : 25Cr)							
ELEN0002-2	*Introduction to audio and video techniques* (anglais) - JeanJacques EMBRECHTS - [8h Labo.] **Corequis :** ELEN0071-1 - Digital Signal Processing	B1	Q1	30	22	[+]	**5**
ELEN0060-2	*Information and coding theory* (anglais) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	**5**
ELEN0071-1	*Digital Signal Processing* (anglais) - Jacques VERLY - [40h Proj.]	B1	Q2	45	15	[+]	**5**
INFO0012-3	*Computation structures* (anglais) - Pierre WOLPER - [50h Proj.]	B1	Q1	30	25	[+]	**5**
MATH0461-2	*Introduction to numerical optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
Electronic systems and devices 1 (B1 : 25Cr)							
ELEN0004-1	*Semiconductor devices* (anglais) - Benoît VANDERHEYDEN	B1	Q1	30	30	-	**5**
ELEN0038-1	*Microsystems* (anglais) - Michael KRAFT - [20h Labo., 40h Proj.]	B1	Q2	30	5	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B1	Q2	30	-	[+]	**5**
ELEN0078-2	*Acoustics and electroacoustics* (anglais) - JeanJacques EMBRECHTS - [8h Labo.]	B1	Q2	30	22	[+]	**5**
INFO0012-3	*Computation structures* (anglais) - Pierre WOLPER - [50h Proj.]	B1	Q1	30	25	[+]	**5**

Corequis :
INFO2009-2 - Introduction à l'informatique
INFO0061-3 - Organisation des ordinateurs

Electric power and energy systems 1 (B1 : 25Cr)

ELEC0014-3	*Introduction to electric power and energy systems* (anglais) - Thierry VAN CUTSEM - [1j T. t.]	B1	Q1	28	12	[+]	**4**
ELEC0018-1	*Energy market* (anglais) - Damien ERNST	B1	Q2	45	15	-	**5**
ELEC0029-2	*Electric power systems analysis* (anglais) - Thierry VAN CUTSEM - [20h Proj.]	B1	Q2	16	8	[+]	**3**
ELEC0041-1	*Modelling and design of electromagnetic systems* (anglais) - Patrick DULAR, Christophe GEUZAINE	B1	Q2	30	30	-	**5**
MATH0461-2	*Introduction to numerical optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
ELEC0445-1	*High Voltage Direct Current (HVDC) grids* (anglais) - Patricia ROUSSEAUX **Corequis :** ELEC0014-3 - Introduction to electric power and energy systems	B1	Q2	16	12	-	**3**

Choose one of the following foci : (B2 : 30Cr)

Research Focus (B2 : 30Cr)

Carry on the option begun (B2 : 15Cr)

Remarque : Carry on the orientation begun in Master 1 for 15 ECTS minimum. These 15 ECTS consist of a 5 ECTS compulsory course and optional courses for a minimum of 10 ECTS. The remaining credits may be chosen in the list below (including internship) or within the courses that have not been taken in Master 1. This choice must be approved by the President of the cycle's Jury. Students who have already taken one or more optional courses found in this list cannot take them again.

Signal processing and control 2 (B2 : 15Cr)

Compulsory course

ELEN0062-1	*Applied inductive learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**

Optional courses

Choose 10 credits from the following list : (B2 : 10Cr)

ELEN0016-2	*Computer vision* (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	B2	Q1	30	10	[+]	**5**
ELEN0019-2	*Audio signal processing : principles and experiments* (anglais) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.] **Prérequis :** ELEN0002-2 - Introduction to audio and video techniques	B2	Q1	5	-	[+]	**5**
ELEN0072-1	*Statistical signal processing* (anglais) - Jacques VERLY - [40h Proj.] **Prérequis :** ELEN0071-1 - Digital Signal Processing	B2	Q1	45	15	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q2	30	-	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Renaud DETRY - [80h Proj.]	B2	Q2	30	4	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) -	B2	Q1	30	15	[+]	**5**

	Christophe GEUZAINE - [20h Proj.]						
GBIO0008-2	*Medical imaging* (anglais) - Christophe PHILLIPS - [8h Labo., 1j T. t.]	B2	Q2	33	12	[+]	**5**

Electronic systems and devices 2 (B2 : 15Cr)

Compulsory course

ELEN0062-1	*Applied inductive learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**

Optional courses

Choose 10 credits from the following list : (B2 : 10Cr)

ELEC0017-1	*Electromagnetic compatibility* (anglais) - Véronique BEAUVOIS, Christophe GEUZAINE	B2	Q1	20	40	-	**5**
ELEC0054-1	*Application of electrical measurement systems* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q1	30	10	[+]	**5**
ELEN0069-1	*Nanoelectronics / Optoelectronics* (anglais) - Benoît VANDERHEYDEN - [40h Proj.] **Prérequis :** ELEN0004-1 - Semiconductor devices	B2	Q2	30	-	[+]	**5**
GBIO0029-1	*Bioelectronics* (anglais) - Michael KRAFT - [20h Labo., 20h Proj.]	B2	Q1	30	15	[+]	**5**
MECA0009-2	*Introduction to microtechnology* (anglais) - Tristan GILET - [8h Labo., 22h Proj.]	B2	Q2	12	12	[+]	**5**

Electric power and energy systems 2

Compulsory course

MECA0450-3	*Renewable energies* (anglais) - Pierre DEWALLEF - [24h Proj., 1j T. t.]	B2	Q1	24	12	[+]	**5**

Optional courses

Choose 10 credits from the following list : (B2 : 10Cr)

ELEC0436-1	*Electric Energy Management Systems* (anglais) - Patricia ROUSSEAUX - [12h Labo., 20h Proj.] **Prérequis :** ELEC0029-2 - Electric power systems analysis	B2	Q1	20	16	[+]	**5**
ELEC0047-1	*Electric power systems dynamics, control and stability* (anglais) - Thierry VAN CUTSEM - [25h Labo., 20h Proj.] **Prérequis :** ELEC0029-2 - Electric power systems analysis	B2	Q1	25	4	[+]	**5**
ELEN0062-1	*Applied inductive learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
ELEC0445-1	*High Voltage Direct Current (HVDC) grids* (anglais) - Patricia ROUSSEAUX	B2	Q2	16	12	-	**3**
ELEN0445-1	*Microgrids* (anglais) - Damien ERNST **Prérequis :** ELEC0014-3 - Introduction to electric power and energy systems	B2	Q1	18	18	-	**3**
CHIM0664-1	*Electrochemical energy conversion and storage* (anglais) - Nathalie JOB	B2	Q1	15	15	-	**3**

[...] The remaining credits may be chosen in options or the internship list. This choice must be approved

by the President of the cycle's Jury.

Internship

ASTG0019-1	*Internship (distinct from master's thesis)* - Christophe GEUZAINE - [40j T. t.]	B2	TA	-	-	[+]	**10**
ASTG0026-1	*Internship (linked to master's thesis)* - COLLÉGIALITÉ, Christophe GEUZAINE - [80j T. t.]	B2	TA	-	-	[+]	**5**

Optional course outside the Electrical Engineering curriculum

[...] One course to choose from the ULg courses programme ; this choice must have the approval of the cycle's jury President

Professional focus in sustainable automotive engineering (B2 : 30Cr)

ASTG0117-1	*Integration internship* - Pierre DEWALLEF **Corequis :** ATFE0013-1 - Travail de fin d'études GEST3162-1 - Principles of management	B2	TA	-	-	-	**5**

Module 1 : Vehicle dynamics and safety

MECA0492-2	*Vehicle dynamics* (anglais) - Pierre DUYSINX **Corequis :** MECA0493-2 - Vehicle aerodynamics MECA0494-3 - Driveline and braking systems MECA0495-1 - Introduction to vehicle safety and body structure design MECA0496-2 - Materials for automotive applications	B2	Q1	25	15	-	**3**
MECA0493-2	*Vehicle aerodynamics* (anglais) - - Suppl : Pierre DUYSINX, Vincent TERRAPON **Corequis :** MECA0492-2 - Vehicle dynamics MECA0494-3 - Driveline and braking systems MECA0495-1 - Introduction to vehicle safety and body structure design MECA0496-2 - Materials for automotive applications	B2	Q1	15	10	-	**2**
MECA0494-3	*Driveline and braking systems* (anglais) - Olivier BRULS, Pierre DUYSINX **Corequis :** MECA0492-2 - Vehicle dynamics MECA0493-2 - Vehicle aerodynamics MECA0495-1 - Introduction to vehicle safety and body structure design MECA0496-2 - Materials for automotive applications	B2	Q1	25	15	-	**3**
MECA0495-1	*Introduction to vehicle safety and body structure design* (anglais) - Pierre DUYSINX, Ludovic NOELS **Corequis :** MECA0492-2 - Vehicle dynamics MECA0493-2 - Vehicle aerodynamics MECA0494-3 - Driveline and braking systems MECA0496-2 - Materials for automotive applications	B2	Q1	15	10	-	**2**
MECA0496-2	*Materials for automotive applications* (anglais) - Jacqueline LECOMTEBECKERS, Ahmed RASSILI **Corequis :** MECA0492-2 - Vehicle dynamics MECA0493-2 - Vehicle aerodynamics MECA0494-3 - Driveline and braking systems MECA0495-1 - Introduction to vehicle safety and body structure design	B2	Q1	25	15	-	**3**

Module 2 : Engine and electric propulsion systems

MECA0497-2	*Vehicle performance* (anglais) - Pierre DUYSINX **Corequis :**	B2	Q1	15	10	-	**2**

MECA0498-2 - Internal combustion engines
MECA0499-2 - Electric traction motors
MECA0500-2 - Hybrid electric and fuel cell vehicles
MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0498-2	*Internal combustion engines* (anglais) - Philippe NGENDAKUMANA **Corequis :** MECA0497-2 - Vehicle performance MECA0499-2 - Electric traction motors MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0501-1 - Thermal and Electrical Management of vehicles	B2	Q1	25	15	-	**3**
MECA0499-2	*Electric traction motors* (anglais) - Johan GYSELINCK **Corequis :** MECA0497-2 - Vehicle performance MECA0498-2 - Internal combustion engines MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0501-1 - Thermal and Electrical Management of vehicles	B2	Q1	15	10	-	**2**
MECA0500-2	*Hybrid electric and fuel cell vehicles* (anglais) - Pierre DUYSINX, Nathalie JOB **Corequis :** MECA0497-2 - Vehicle performance MECA0498-2 - Internal combustion engines MECA0499-2 - Electric traction motors MECA0501-1 - Thermal and Electrical Management of vehicles	B2	Q1	25	15	-	**3**
MECA0501-1	*Thermal and Electrical Management of vehicles* (anglais) - Vincent LEMORT **Corequis :** MECA0497-2 - Vehicle performance MECA0498-2 - Internal combustion engines MECA0499-2 - Electric traction motors MECA0500-2 - Hybrid electric and fuel cell vehicles	B2	Q1	15	10	-	**2**

Programme transitoire à destination des étudiants ayant réussi leur master 1 de "Master en ingénieur civil électricien, à finalité spécialisée en technologies durables en automobile" en 2014-2015

Optional courses (B1 : 30Cr)

Choose one focus : (B1 : 30Cr)

Professional focus in sustainable automotive engineering (B1 : 30Cr)

ASTG0117-1	*Integration internship* - Pierre DEWALLEF	B1	TA	-	-	-	**5**

Module 1 : Vehicle dynamics and safety

MECA0492-2	*Vehicle dynamics* (anglais) - Pierre DUYSINX	B1	Q1	25	15	-	**3**
MECA0493-2	*Vehicle aerodynamics* (anglais) - - Suppl : Pierre DUYSINX, Vincent TERRAPON	B1	Q1	15	10	-	**2**
MECA0494-3	*Driveline and braking systems* (anglais) - Olivier BRULS, Pierre DUYSINX	B1	Q1	25	15	-	**3**
MECA0495-1	*Introduction to vehicle safety and body structure design* (anglais) - Pierre DUYSINX, Ludovic NOELS	B1	Q1	15	10	-	**2**
MECA0496-2	*Materials for automotive applications* (anglais) - Jacqueline LECOMTEBECKERS, Ahmed RASSILI	B1	Q1	25	15	-	**3**

Module 2 : Engine and electric propulsion systems

MECA0497-2	*Vehicle performance* (anglais) - Pierre DUYSINX	B1	Q1	15	10	-	**2**
MECA0498-2	*Internal combustion engines* (anglais) - Philippe NGENDAKUMANA	B1	Q1	25	15	-	**3**
MECA0499-2	*Electric traction motors* (anglais) - Johan GYSELINCK	B1	Q1	15	10	-	**2**
MECA0500-2	*Hybrid electric and fuel cell vehicles* (anglais) - Pierre DUYSINX, Nathalie JOB	B1	Q1	25	15	-	**3**
MECA0501-1	*Thermal and Electrical Management of vehicles* (anglais) - Vincent LEMORT	B1	Q1	15	10	-	**2**

Cours obligatoires (B1 : 30Cr)

ATFE0014-1	*Master thesis* - COLLÉGIALITÉ - [750h Proj.]	B1	TA	-	-	[+]	**25**
GEST3162-1	*Principles of management* (anglais) - Michael GHILISSEN, François PICHAULT, Thierry PIRONET, Didier VAN CAILLIE	B1	Q1	25	25	-	**5**

Programme transitoire à destination des étudiants ayant réussi leur master 1 de "Master en ingénieur civil électricien, à finalité approfondie" en 2014-2015

Optional courses (B1 : 30Cr)

Choose one focus : (B1 : 30Cr)

Research focus (B1 : 30Cr)

Carry on the option begun (B1 : 15Cr)

Signal processing and control 2 (B1 : 30Cr)

ELEN0062-1	*Applied inductive learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**

Choose 10 credits of the following : (B1 : 30Cr)

ELEN0016-2	*Computer vision* (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	B1	Q1	30	10	[+]	**5**
ELEN0019-2	*Audio signal processing : principles and experiments* (anglais) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.]	B1	Q1	5	-	[+]	**5**
ELEN0072-1	*Statistical signal processing* (anglais) - Jacques VERLY - [40h Proj.]	B1	Q1	45	15	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B1	Q2	30	-	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Renaud DETRY - [80h Proj.]	B1	Q2	30	4	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	B1	Q1	30	15	[+]	**5**
GBIO0008-2	*Medical imaging* (anglais) - Christophe PHILLIPS - [8h Labo., 1j T. t.]	B1	Q2	33	12	[+]	**5**

Electronic systems and devices 2 (B1 : 30Cr)

ELEN0062-1	*Applied inductive learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**

Choose 10 credits of the following : (B1 : 30Cr)

ELEC0017-1	*Electromagnetic compatibility* (anglais) - Véronique BEAUVOIS, Christophe GEUZAINE	B1	Q1	20	40	-	**5**
ELEC0054-1	*Application of electrical measurement systems* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B1	Q1	30	10	[+]	**5**
ELEN0069-1	*Nanoelectronics / Optoelectronics* (anglais) - Benoît VANDERHEYDEN - [40h Proj.]	B1	Q2	30	-	[+]	**5**
GBIO0029-1	*Bioelectronics* (anglais) - Michael KRAFT - [20h Labo., 20h Proj.]	B1	Q1	30	15	[+]	**5**
MECA0009-2	*Introduction to microtechnology* (anglais) - Tristan GILET - [8h Labo., 22h Proj.]	B1	Q2	12	12	[+]	**5**

Electric power and energy systems 2 (B1 : 30Cr)

MECA0450-3	*Renewable energies* (anglais) - Pierre DEWALLEF - [24h Proj., 1j T. t.]	B1	Q1	24	12	[+]	**5**

Choose 10 credits of the following : (B1 : 30Cr)

ELEC0436-1	*Electric Energy Management Systems* (anglais) - Patricia ROUSSEAUX - [12h Labo., 20h Proj.]	B1	Q1	20	16	[+]	**5**
ELEC0047-1	*Electric power systems dynamics, control and stability* (anglais) - Thierry VAN CUTSEM - [25h Labo., 20h Proj.]	B1	Q1	25	4	[+]	**5**
ELEN0062-1	*Applied inductive learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
ELEC0445-1	*High Voltage Direct Current (HVDC) grids* (anglais) - Patricia ROUSSEAUX	B1	Q2	16	12	-	**3**
ELEN0445-1	*Microgrids* (anglais) - Damien ERNST	B1	Q1	18	18	-	**3**
CHIM0664-1	*Electrochemical energy conversion and storage* (anglais) - Nathalie JOB	B1	Q1	15	15	-	**3**

The remaining credits may be chosen below : (B1 : 30Cr)

[...]	The remaining credits may be chosen in options or the internship list. This choice must be approved by the President of the cycle's Jury.						
ASTG0019-1	*Internship (distinct from master's thesis)* - Christophe GEUZAINE - [40j T. t.]	B1	TA	-	-	[+]	**10**
[...]	One course to choose from the ULg courses programme ; this choice must have the approval of the cycle's jury President						

Cours obligatoires (B1 : 30Cr)

ATFE0014-1	*Master thesis* - COLLÉGIALITÉ - [750h Proj.]	B1	TA	-	-	[+]	**25**
GEST3162-1	*Principles of management* (anglais) - Michael GHILISSEN, François PICHAULT, Thierry PIRONET, Didier VAN CAILLIE	B1	Q1	25	25	-	**5**