Cycle view of the study programme

		Bl	Or	Th	Pr	Au	Cr
Compulsory Courses (B1 : 35Cr, B2 : 30Cr)							
SYST0003-1	*Linear control systems* (english language) - Guillaume DRION - [6h Labo.]	B1	Q1	30	30	[+]	**5**
INFO0062-1	*Object-oriented programming* (english language) - Bernard BOIGELOT - [20h Proj.]	B1	Q2	30	24	[+]	**5**
ELEC0055-2	*Electronic control systems* (english language) - Fabrice FREBEL, Christophe GEUZAINE	B1	Q1	30	6	-	**3**
INFO0064-2	*Embedded systems* (english language) - Bernard BOIGELOT **Corequisite :** APRI0007-1 - Major project in electronics (including fundamentals of project management)	B1	Q1	25	20	-	**3**
ELEN0017-1	*Analysis and Design of Telecommunications Systems* (english language) - Marc VAN DROOGENBROECK	B1	Q1	30	30	-	**5**
ELEN0037-1	*Microelectronics and IC design* (english language) - Michael KRAFT - [40h Proj.]	B1	Q2	30	20	[+]	**5**
APRI0007-1	*Major project in electronics (including fundamentals of project management)* (english language) - Marc BIRON, Bernard BOIGELOT, Guillaume DRION, Fabrice FREBEL, Christophe GEUZAINE - [80h Proj.] **Corequisite :** ELEC0055-2 - Electronic control systems SYST0003-1 - Linear control systems INFO0064-2 - Embedded systems	B1	TA	20	-	[+]	**9**
GEST3162-1	*Principles of management* (english language) - 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)							

Notice : 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* (english language) - JeanJacques EMBRECHTS - [8h Labo.] **Corequisite :** ELEN0071-1 - Digital Signal Processing	B1	Q1	30	22	[+]	**5**
ELEN0060-2	*Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	**5**
ELEN0071-1	*Digital Signal Processing* (english language) - Jacques VERLY - [40h Proj.]	B1	Q2	45	15	[+]	**5**
INFO0012-3	*Computation structures* (english language) - Pierre WOLPER - [50h Proj.]	B1	Q1	30	25	[+]	**5**
MATH0461-2	*Introduction to numerical optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
Electronic systems and devices 1 (B1 : 25Cr)							
ELEN0004-1	*Semiconductor devices* (english language) - Benoît VANDERHEYDEN	B1	Q1	30	30	-	**5**
ELEN0038-1	*Microsystems* (english language) - Michael KRAFT - [20h Labo., 40h Proj.]	B1	Q2	30	5	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.]	B1	Q2	30	-	[+]	**5**

ELEN0078-2	*Acoustics and electroacoustics* (english language) - JeanJacques EMBRECHTS - [8h Labo.]	B1	Q2	30	22	[+]	**5**
INFO0012-3	*Computation structures* (english language) - Pierre WOLPER - [50h Proj.] **Corequisite :** INFO2009-2 - Introduction à l'informatique INFO0061-3 - Organisation des ordinateurs	B1	Q1	30	25	[+]	**5**

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

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

Notice : 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* (english language) - 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* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	B2	Q1	30	10	[+]	**5**
ELEN0019-2	*Audio signal processing : principles and experiments* (english language) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.] **Prerequisite :** ELEN0002-2 - Introduction to audio and video techniques	B2	Q1	5	-	[+]	**5**
ELEN0072-1	*Statistical signal processing* (english language) - Jacques VERLY - [40h Proj.] **Prerequisite :** ELEN0071-1 - Digital Signal Processing	B2	Q1	45	15	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q2	30	-	[+]	**5**

INFO0948-2	*Introduction to intelligent robotics* (english language) - Renaud DETRY - [80h Proj.]	B2	Q2	30	4	[+]	**5**
MATH0462-1	*Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
INFO0939-1	*High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.]	B2	Q1	30	15	[+]	**5**
GBIO0008-2	*Medical imaging* (english language) - Christophe PHILLIPS - [8h Labo., 1d FW]	B2	Q2	33	12	[+]	**5**

Electronic systems and devices 2 (B2 : 15Cr)

Compulsory course

ELEN0062-1	*Applied Inductive Learning* (english language) - 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* (english language) - Véronique BEAUVOIS, Christophe GEUZAINE	B2	Q1	20	40	-	**5**
ELEC0054-1	*Application of electrical measurement systems* (english language) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q1	30	10	[+]	**5**
ELEN0069-1	*Nanoelectronics / Optoelectronics* (english language) - Benoît VANDERHEYDEN - [40h Proj.] **Prerequisite :** ELEN0004-1 - Semiconductor devices	B2	Q2	30	-	[+]	**5**
GBIO0029-1	*Bioelectronics* (english language) - Michael KRAFT - [20h Labo., 20h Proj.]	B2	Q1	30	15	[+]	**5**
MECA0009-2	*Introduction to microtechnology* (english language) - Tristan GILET - [8h Labo., 22h Proj.]	B2	Q2	12	12	[+]	**5**

Electric power and energy systems 2

Compulsory course

MECA0450-3	*Renewable energies* (english language) - Pierre DEWALLEF - [24h Proj., 1d FW]	B2	Q1	24	12	[+]	**5**

Optional courses

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

ELEC0436-1	*Electric Energy Management Systems* (english language) - Patricia ROUSSEAUX - [12h Labo., 20h Proj.] **Prerequisite :** ELEC0029-2 - Electric power systems analysis	B2	Q1	20	16	[+]	**5**
ELEC0047-1	*Electric power systems dynamics, control and stability* (english language) - Thierry VAN CUTSEM - [25h Labo., 20h Proj.] **Prerequisite :** ELEC0029-2 - Electric power systems analysis	B2	Q1	25	4	[+]	**5**
ELEN0062-1	*Applied Inductive Learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**
MATH0462-1	*Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
ELEC0445-1	*High Voltage Direct Current (HVDC) grids* (english language) - Patricia ROUSSEAUX	B2	Q2	16	12	-	**3**

ELEN0445-1	*Microgrids* (english language) - Damien ERNST **Prerequisite :** ELEC0014-3 - Introduction to electric power and energy systems	B2	Q1	18	18	-	**3**
CHIM0664-1	*Electrochemical energy conversion and storage* (english language) - 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 - [40d FW]	B2	TA	-	-	[+]	**10**
ASTG0026-1	*Internship (linked to master's thesis)* - COLLÉGIALITÉ, Christophe GEUZAINE - [80d FW]	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 **Corequisite :** 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* (english language) - Pierre DUYSINX **Corequisite :** 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* (english language) - - Suppl : Pierre DUYSINX, Vincent TERRAPON **Corequisite :** 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* (english language) - Olivier BRULS, Pierre DUYSINX **Corequisite :** 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* (english language) - Pierre DUYSINX, Ludovic NOELS **Corequisite :** 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* (english language) - Jacqueline LECOMTEBECKERS, Ahmed RASSILI **Corequisite :** MECA0492-2 - Vehicle dynamics MECA0493-2 - Vehicle aerodynamics	B2	Q1	25	15	-	**3**

MECA0494-3 - Driveline and braking systems
MECA0495-1 - Introduction to vehicle safety and body structure design

Module 2 : Engine and electric propulsion systems

MECA0497-2	*Vehicle performance* (english language) - Pierre DUYSINX **Corequisite :** 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	B2	Q1	15	10	-	**2**
MECA0498-2	*Internal combustion engines* (english language) - Philippe NGENDAKUMANA **Corequisite :** 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* (english language) - Johan GYSELINCK **Corequisite :** 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* (english language) - Pierre DUYSINX, Nathalie JOB **Corequisite :** 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* (english language) - Vincent LEMORT **Corequisite :** 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* (english language) - Pierre DUYSINX	B1	Q1	25	15	-	**3**
MECA0493-2	*Vehicle aerodynamics* (english language) - - Suppl : Pierre DUYSINX, Vincent TERRAPON	B1	Q1	15	10	-	**2**
MECA0494-3	*Driveline and braking systems* (english language) - Olivier BRULS, Pierre DUYSINX	B1	Q1	25	15	-	**3**

MECA0495-1	*Introduction to vehicle safety and body structure design* (english language) - Pierre DUYSINX, Ludovic NOELS	B1	Q1	15	10	-	**2**
MECA0496-2	*Materials for automotive applications* (english language) - Jacqueline LECOMTEBECKERS, Ahmed RASSILI	B1	Q1	25	15	-	**3**

Module 2 : Engine and electric propulsion systems

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

Compulsory courses (B1 : 30Cr)

ATFE0014-1	*Master Thesis* - COLLÉGIALITÉ - [750h Proj.]	B1	TA	-	-	[+]	**25**
GEST3162-1	*Principles of management* (english language) - 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* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**

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

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

GBIO0008-2	*Medical imaging* (english language) - Christophe PHILLIPS - [8h Labo., 1d FW]	B1	Q2	33	12	[+]	**5**

Electronic systems and devices 2 (B1 : 30Cr)

ELEN0062-1	*Applied Inductive Learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**

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

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

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

MECA0450-3	*Renewable energies* (english language) - Pierre DEWALLEF - [24h Proj., 1d FW]	B1	Q1	24	12	[+]	**5**

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

ELEC0436-1	*Electric Energy Management Systems* (english language) - Patricia ROUSSEAUX - [12h Labo., 20h Proj.]	B1	Q1	20	16	[+]	**5**
ELEC0047-1	*Electric power systems dynamics, control and stability* (english language) - Thierry VAN CUTSEM - [25h Labo., 20h Proj.]	B1	Q1	25	4	[+]	**5**
ELEN0062-1	*Applied Inductive Learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**
MATH0462-1	*Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
ELEC0445-1	*High Voltage Direct Current (HVDC) grids* (english language) - Patricia ROUSSEAUX	B1	Q2	16	12	-	**3**
ELEN0445-1	*Microgrids* (english language) - Damien ERNST	B1	Q1	18	18	-	**3**
CHIM0664-1	*Electrochemical energy conversion and storage* (english language) - 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 - [40d FW]	B1	TA	-	-	[+]	**10**
[...]	One course to choose from the ULg courses programme ; this choice must have the approval of the cycle's jury President						

Compulsory courses (B1 : 30Cr)

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