

Faculty of Applied Sciences



ELME2

Ingénieur civil électromécanicien (Diploma of the Second Cycle (Ingénieur civil) in Electromechanical Engineering)



Programme management

ELME Commission interdépartementale de gestion des programmes électricité et mécanique

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Study objectives

The programmes leading to the degree in Civil Electro-mechanics Engineering - Mechatronics orientation and Energy orientation - aim to train engineers with a pluridisciplinary profile, capable of managing interface problems posed by the integration of several subject areas within a given equipment or system. The Mechatronics orientation puts the focus on studies in electronics, mechanical production and automatics, the Energy orientation put the focus on electricity, thermodynamics and energetics..

Admission conditions

The programme leading to a degree in Civil Electro-mechanics Engineering is accessible to all students holding the first university study cycle diploma ("candidature") in Civil Engineering. Industrial engineers and certain university degree holders in subjects relating to the Exact Sciences may also be entitled access, as may students with a foreign degree judged as being equivalent.

Admission procedure

The University admission and enrolment procedures are detailed in the section : "Access to studies" on the web page : <http://www.ucl.ac.be/etudes/libres/acces.html>

General structure of the programme

The choice of the Energy or Mechatronics orientations is made right from the start of the 1st year, with the possibility of a reorientation at the end of the 1st quadrimester. The individual work tasks and projects play an important role in the study programme, in the form of activities attached to the course subjects, in the form of a pluridisciplinary project (integrated project in mechatronics) and in the form of an end of course project.

Programme content

1. Programme composition

The Civil Electro-mechanic Engineering degree may be obtained either in the " Mechatronic " orientation or in the " Energy " orientation.

"Mechatronics" orientation

General and polyvalent courses

General courses

<u>FSA2140</u>	Eléments de droit industriel[22.5h] (2 credits) (in French)	Gilbert Demez
<u>FSA2300</u>	Religious Science Questions[15h] (2 credits) (in French)	Bernard Van Meenen
<u>INMA2701</u>	A préciser (in French)	
<u>INGI2716</u>	Computer science 3[30h+30h] (5 credits) (in French)	Marc Lobelle
<i>Two courses to be chosen from among :</i>		
<u>FSA2230</u>	Introduction to management and to business economics[30h+15h] (4 credits) (in French)	Paul Belleflamme, Benoît Gailly
<u>FSA2240</u>	Foundations of financial management[30h+15h] (4 credits) (in French)	Philippe Grégoire
<u>FSA2250</u>	Project management[15h+15h] (3 credits) (in French)	Jean-Pierre Decostre

FSA2323 none[30h+15h] (4 credits) (in French) Jean-Pierre Hansen, Yves Smeers

Polyvalent courses

MECA2855 A préciser (in French)

MECA2901 A préciser (in French)

MECA2100 A préciser (in French)

Specialised courses

These include a collection of courses managed by the MECA, ELEC, INMA and INFO Departments, as well as an integrated interdisciplinary project. The programme details are given in point 2.

Options

Each student will make a choice of technical courses leading to a programme comprising at least 170 credits, throughout the duration of the three years. This programme may include courses from KULeuven; it must be approved by the ELME degree programme Management Committee.

Language course

During the second study cycle, the students may follow various language courses, organised by the ILV. These courses represent a minimum of 30 hours (3 credits) within the total volume of the optional part of their programme.

A specific course, aimed at improving the linguistic skills and professional interactive communication capacities of the students, is especially organised for the FSA students.

ANGL2470 English communication skills for engineers[30h] (3 credits) Ahmed Adriouèche, Henri November, Severine Schmit

Apprenticeship

The students are encouraged to carry out an apprenticeship in a firm for a minimal duration of four weeks during their second cycle of studies. This apprenticeship represents 3 ECTS of the calculated volume of their programme. It is subject to the prior approval of the apprenticeship supervisor from the programme Management Committee and will conclude with a report. It will be ratified by an evaluation specifying "has/has not satisfied the requirements".

End of course project

This piece of work represents an individual work load equivalent to half a year's work (25 credits).

"Energy" orientation

General and polyvalent courses

General courses

FSA2140 Eléments de droit industriel[22.5h] (2 credits) (in French) Gilbert Demez

FSA2300 Religious Science Questions[15h] (2 credits) (in French) Bernard Van Meenen

INMA2701 A préciser (in French)

INGI2716 Computer science 3[30h+30h] (5 credits) (in French) Marc Lobelle

Two courses to be chosen from among :

FSA2230 Introduction to management and to business economics[30h+15h] (4 credits) (in French) Paul Belleflamme, Benoît Gailly

FSA2240 Foundations of financial management[30h+15h] (4 credits) (in French) Philippe Grégoire

FSA2250 Project management[15h+15h] (3 credits) (in French) Jean-Pierre Decostre

FSA2323 none[30h+15h] (4 credits) (in French) Jean-Pierre Hansen, Yves Smeers

Polyvalent courses

MAPR2805 A préciser (in French)

MECA2100 A préciser (in French)

The students will only follow [30 hours + 30 hours]

MECA2855 A préciser (in French)

Specialised courses

These include a collection of courses managed by the MECA, ELEC and INMA Departments. The programme details are given in point 2.

Options

Each student will make a choice of technical courses leading to a programme comprising at least 170 credits throughout the duration of the three years. This programme may include courses from KULeuven; it must be approved by the ELME programme Management Committee.

Language course

During the second cycle, the students may follow various language courses, organised by the ILV. These courses represent a minimum of 30 hours (3 credits) of the total volume of the optional part of their programme.

A specific course aimed at improving the linguistic skills and professional interactive communication capacities of the students, is especially organised for the FSA students.

ANGL2470 English communication skills for engineers[30h] (3 credits) Ahmed Adriouèche, Henri November, Severine Schmit

Apprenticeship

The students are encouraged to carry out an apprenticeship in a firm for a minimal duration of four weeks during their second cycle of studies. This apprenticeship represents 3 ECTS of the calculated volume of their programme. It is subject to the prior approval of the apprenticeship supervisor from the programme Management Committee and will conclude with a report. It will be ratified by an evaluation specifying "has/has not satisfied the requirements".

End of course project

This piece of work represents an individual work load equivalent to half a year's work (25 credits).

2. Programme per year of studies

The programmes listed below only present the compulsory courses. In ELME 22 or ELME 23, the students must take semi-optional courses and options. For the former, they need to choose a certain number of courses from an imposed list in two domains : Economics (for all students) and Automatics (only for the Mechatronics orientation).

1. Economics : choice of two courses from among the following four :

<u>FSA2230</u>	Introduction to management and to business economics[30h+15h] (4 credits) (in French)	Paul Belleflamme, Benoît Gailly
<u>FSA2240</u>	Foundations of financial management[30h+15h] (4 credits) (in French)	Philippe Grégoire
<u>FSA2250</u>	Project management[15h+15h] (3 credits) (in French)	Jean-Pierre Decostre
<u>FSA2323</u>	none[30h+15h] (4 credits) (in French)	Jean-Pierre Hansen, Yves Smeers

2. Automatics : the mechatronics will choose only one course in Automatics from among the following five :

<u>MECA2671</u>	Automatic : Theory and implementation[30h+45h] (6 credits) (in French)	Michel Gevers, Vincent Wertz, Vincent Wertz (supplée Michel Gevers)
<u>INMA2370</u>	Modelling and analysis of dynamical systems[30h+30h] (5 credits) (in French)	Georges Bastin, Vincent Wertz, Vincent Wertz (supplée Georges Bastin)
<u>ELEC2875</u>	SYSTEM IDENTIFICATION[30h+30h] (5 credits) (in French)	Michel Gevers
<u>INMA2360</u>	Advanced methods in automatic control[30h+22.5h] (5 credits) (in French)	Pierre-Antoine Absil, Georges Bastin, Michel Gevers (coord.), Vincent Wertz
<u>INMA2361</u>	Nonlinear systems[30h+22.5h] (5 credits) (in French)	Rodolphe Sepulchre

As far as the options are concerned, each student will make a choice of optional courses leading to a programme comprising at least 175 credits throughout the duration of the three years. The student may, subject to the agreement of the ELME programme Management Committee, modify the spreading of the volume between ELME 22 and ELME 23, by inverting the compulsory or optional courses. The programme of each student will be submitted to the ELME programme Management Committee for approval.

ELME 21 First year**"Mechatronics" orientation**

First quadrimester

<u>INMA2701</u>	A préciser (in French)
<u>MECA2855</u>	A préciser (in French)
<u>MECA2901</u>	A préciser (in French)
<u>ELEC2755</u>	A préciser (in French)
<u>ELEC2370</u>	A préciser (in French)
<u>ELEC2101</u>	A préciser (in French)

Second quadrimester

<u>MECA2100</u>	A préciser (in French)	
<u>MECA2953</u>	Kinematics and dynamics of machinery.[22.5h+7.5h] (3 credits) (in French)	David Johnson
<u>ELEC2310</u>	A préciser (in French)	
<u>ELEC2102</u>	A préciser (in French)	
<u>ELEC2510</u>	A préciser (in French)	
<u>ELEC2530</u>	A préciser (in French)	
<u>MECA2510</u>	A préciser (in French)	
<u>MECA2321</u>	A préciser (in French)	

"Energy" orientation

First quadrimester

<u>INMA2701</u>	A préciser (in French)
<u>MAPR2805</u>	A préciser (in French)
<u>MECA2901</u>	A préciser (in French)
<u>ELEC2370</u>	A préciser (in French)

<u>ELEC2755</u>	A préciser (in French)	
The students will only follow [15 hours + 15 hours]		
<u>ELEC2101</u>	A préciser (in French)	
<u>MECA2855</u>	A préciser (in French)	
<u>MECA2200</u>	A préciser (in French)	
Second quadrimester		
<u>INGI2716</u>	Computer science 3[30h+30h] (5 credits) (in French)	Marc Lobelle
<u>MECA2100</u>	A préciser (in French)	
<u>MECA2953</u>	Kinematics and dynamics of machinery.[22.5h+7.5h] (3 credits) (in French)	David Johnson
<u>ELEC2310</u>	A préciser (in French)	
<u>ELEC2102</u>	A préciser (in French)	
<u>MECA2200</u>	A préciser (in French)	
<u>MECA2321</u>	A préciser (in French)	
<u>MECA2510</u>	A préciser (in French)	

ELME 22 Second year

"Mechatronics" orientation

First quadrimester

<u>ELEC2531</u>	Electronics II : Digital electronic circuits[30h+30h] (5 credits) (in French)	Jean-Didier Legat, Charles Trullemans
<u>ELEC2660</u>	Power electronic[30h+30h] (5 credits) (in French)	Francis Labrique
<u>ELEC2103</u>	Project in Electricity 3 : Electronic systems[90h] (6 credits) (in French)	Jean-Didier Legat, Luc Vandendorpe

This course is taught over the two quadrimesters

<u>MECA2821</u>	A préciser (in French)	
<u>MECA2755</u>	Industrial automation.[30h+30h] (5 credits) (in French)	Paul Fisette, Jean-Claude Samin
<u>ELEC2811</u>	Instrumentation and sensors[30h+30h] (5 credits) (in French)	Francis Labrique, Ernest Matagne

Second quadrimester

<u>ELEC2313</u>	Electronic control of electromechanical converters[30h+30h] (5 credits) (in French)	Bruno Dehez, Francis Labrique (coord.), Ernest Matagne
<u>ELEC2532</u>	Electronics III : Analog electronic circuits[30h+30h] (5 credits) (in French)	Jean-Didier Legat, Charles Trullemans, Charles Trullemans (supplée Jean-Didier Legat)
<u>ELEC2811</u>	Instrumentation and sensors[30h+30h] (5 credits) (in French)	Francis Labrique, Ernest Matagne
<u>INGI2315</u>	Computer systems: real-time aspects[30h+15h] (4 credits) (in French)	Jean-Didier Legat, Marc Lobelle (coord.)
<u>INGI2716</u>	Computer science 3[30h+30h] (5 credits) (in French)	Marc Lobelle
<u>MECA2451</u>	A préciser (in French)	
<u>MECA2845</u>	Project work in mechatronics.[30h+45h] (6 credits) (in French)	Paul Fisette (coord.), Ernest Matagne, Benoît Raucent

"Energy" orientation

First quadrimester

<u>ELEC2752</u>	Electronics[30h+15h] (4 credits) (in French)	N.
<u>ELEC2311</u>	PHYSICS OF ELECTROMECHANICAL CONVERTERS[15h+22.5h] (3 credits) (in French)	Bruno Dehez, Francis Labrique (coord.), Ernest Matagne
<u>ELEC2520</u>	ELECTRIC POWER SYSTEMS[30h+30h] (5 credits) (in French)	Noël Janssens
<u>MECA2150</u>	Thermal cycles.[30h+30h] (5 credits) (in French)	Yann Bartosiewicz
<u>MECA2160</u>	Fuels and combustion.[30h+15h] (4 credits) (in French)	Miltiadis Papalexandris, Jacques Vandooren
<u>MECA2322</u>	Fluid mechanics and transfer II.[30h+30h] (5 credits) (in French)	François Dupret, Grégoire Winckelmans
<u>MECA2821</u>	A préciser (in French)	

Second quadrimester

<u>MECA2451</u>	A préciser (in French)	
<u>ELEC2754</u>	Electronics : advanced topics[15h+22.5h] (3 credits) (in French)	Francis Labrique, Ernest Matagne
<u>MECA2220</u>	Internal combustion engines.[30h+15h] (4 credits) (in French)	Hervé Jeanmart

French)
MECA2780 Fluid compressors.[30h+15h] (4 credits) (in French) Tony Arts

ELME 23 Third year

"Mechatronics" orientation

First quadrimester

FSA2140 Eléments de droit industriel[22.5h] (2 credits) (in French) Gilbert Demez
FSA2300 Religious Science Questions[15h] (2 credits) (in French) Bernard Van Meenen

"Energy" orientation

First quadrimester

FSA2140 Eléments de droit industriel[22.5h] (2 credits) (in French) Gilbert Demez
FSA2300 Religious Science Questions[15h] (2 credits) (in French) Bernard Van Meenen

Second quadrimester

ELEC2930 Intoduction to telecommunication[30h+15h] (4 credits) (in French) Auguste Laloux
MAPR2300 Process Control[30h+37.5h] (5 credits) (in French) Georges Bastin, Denis Dochain

Evaluation

The evaluation is organised in the form of exams ; for the subjects including a thesis or a project, the evaluation also includes this work as well as a written and/or oral report. The end of course work presents the opportunity to verify the autonomy of the students in their individual work as well as their capacity to write a thesis and defend it in public.