



TECHNIQUE

**HELMO**  
Haute Ecole  
Libre Mosane

Gramme



# Polyvalent Industrial Engineer



- Bachelor in Industrial Sciences
- Master in Industrial Sciences

[www.helmo.be](http://www.helmo.be)





## Our institute

- **HELMo Gramme**

The Institute was founded in 1906 and the reputation of HELMo Gramme has been settled thanks to a high level of requirements coupled to a serious supervision of students. The theoretical training has always been in close relationship to technical laboratories which provides a very concrete vision of the job of industrial engineer.



## Historical background

- ● The Gramme Institute which recently celebrated its 100th anniversary was founded in 1906 by a Jesuit father. It's one of the 11 institutions which grants the industrial engineer diploma in the French-speaking community of Belgium. Its reputation is based on a challenging level of studies combined with high quality educational mentoring.

The initial training granted for several years the technical engineer diploma (3 years); then it underwent a first fundamental revision in 1977 to move to the new academic degree of industrial engineer (4 years) and a last recent revision of the studies (Bologna) has allowed the graduated students from 2009 on to have the master degree in industrial engineering sciences.

Industrial engineering studies are an audacious mix of engineering sciences (mathematics, physics, chemistry), applied sciences (mechanics, electricity, thermodynamics, ...), technical courses (informatics, design and graphic techniques, technology, ...) and general courses (English, economics, philosophy, ...).

A polyvalent and rational industrial engineer was born out of this prodigious cocktail, able to solve several problems in the industry in which he doesn't take long to bring in his additional value.

But this polyvalence is also for the Gramme engineer an essential asset which allows him, if needed, to redirect his career in another field of the industry.

Proximity educational methods based on modern tools allow the student to let his creativity grow with the years; very early, practical applications, manipulations in the laboratories and group works allow him to master the technical reality. Afterwards, projects and two long-term internships give the student the opportunity to make his first experience in professional life; the last internship involving the carrying out of the final thesis.

During the last five months of his studies, the student is immersed into the day-to-day life of a company which he has chosen according to the final orientation of his curriculum. In this company situated in Belgium or abroad, as an Erasmus student, and sometimes even in collaboration with a non-governmental organisation (NGO), the future engineer can then refresh and revitalize the hundred years' old motto of the Gramme Institute :



	1		2		3	
	H	ECTS	H	ECTS	H	ECTS
<b>Basic sciences</b>						
General Applied Chemistry	105	9				
Organic chemistry			20	2		
Physical chemistry					35	3
Mathematics for the engineer	130	11				
Advanced Mathematics for the engineer			45	4		
Mathematics and Applied Statistics					30	3
Physics 1: mechanics and matter waves	80	6				
Physics 2: light waves and modern physics			40	3		
Biology and Environment			30	2		
Statistical Methods for the engineer			30	2		
<b>Applied Sciences</b>						
Electricity	75	6	55	5		
General Electronics			50	4		
Study of Materials			35	3	20	2
Fluid Mechanics	25	2				
Mechanics : statics	40	3	20	2		
Solid mechanics	45	5	30	2		
Thermodynamics			54	4		
<b>Technical Engineering</b>						
Technology	27	2				
Mechanical Engineering	18	1				
Design and graphic techniques	70	6	70	6		
Mechanical Engineering			27	2		
Introduction to computer science and programming	30	2				
Programming			65	5		
Advanced Programming					15	1
Energy Conversion					35	3
Heat Transfer					27	2
Electronics					65	5
<b>Interdisciplinary training</b>						
English	20	2	20	2	20	2
Industrial Law					15	1
Socio-Economics	15	1	35	3		
Introduction to Philosophy	25	2				
Scientific refresher course	30	2				
Communication			10	1	10	1
Accountancy					30	2
Philosophy : Social Issues					25	2
<b>Courses for the Master in Industrial Engineering Sciences</b>						
Physical and analytical chemistry			45	4		
Kinematics and Dynamics of Mechanisms			24	2	43	4
Civil engineering project			30	2		
Chemical Engineering					55	5
Telecommunications					25	2
Automatics : Logic Systems					65	5
Execution techniques					30	2
Reinforced Concrete					40	3
Structures Analysis					30	2
<b>Professional integration</b>						
Enterprise Immersion : first placement (6 weeks)					120	10
<b>Total</b>	<b>735</b>	<b>60</b>	<b>735</b>	<b>60</b>	<b>735</b>	<b>60</b>

## TRAINING

## AT THE LEADING EDGE OF TECHNOLOGY

Industry is moving, evolving. Each manager must be surrounded by qualified, polyvalent, able to adapt to technological changes collaborators.

Man or woman of action, the industrial engineer is the key partner for successful companies.

HELMo Gramme has been training polyvalent industrial engineers for generations. These engineers are selected to work in the production, research and technological development, sales, management, quality management, ... areas.

Following the so-called «Bologna» reform, the training is being organized in two cycles spread over 5 years :

- Graduate in industrial sciences
- Master in industrial engineering sciences, industry orientation

1<sup>st</sup> cycle

## BACHELOR IN INDUSTRIAL SCIENCES

## TRAINING

These three preparatory years already allow to approach various areas of the industrial engineers' many-sided activity :

- interdisciplinarity because in the company, where the industrial engineer will have to play a part of general coordination, human relationships and management are of the utmost importance,
- sciences and applied mathematics which allow to display technical creativity,
- technique, including the "on the spot" one.

## INTERNSHIPS

At the end of the 3rd year, a first enterprise immersion is organized. This one lasts six weeks from mid-November to the end of December. This internship is an opportunity for the student to get in contact with a technical environment and to learn how to manage it. It is also a means to experience the reality of the world of work.

He will therefore have the opportunity to experience the work in the enterprise, at whatever level of activities and have a global view of the management.

The trainee is also brought to prove his flexibility and ability to adapt to various situations, work or projects which will be proposed to him.

## STRONG POINTS

The reform of Bologna was the opportunity to have a first year of studies which is more "within the reach" with among others a spreading of the courses on five years. This measure has made the transition from secondary education towards higher one easier.



# Bachelor in Industrial Engineering Sciences





	Master 1		Master 2	
	H	ECTS	H	ECTS
<b>Basic and applied sciences</b>				
Industrial electronics	40	4		
Numerical methods for the engineer	55	3		
<b>Technical engineering</b>				
CAO : Introduction to Finite Elements	15	2		
Steel structures	40	3		
Industrial Chemistry	35	3		
Object-oriented modelling and programming	25	2		
Machines Construction	67	5		
Electrical energy	75	6		
Study of materials : polymers and composites	30	2		
Structures Stability Project	25	2		
Physico-chemistry project			30	3
Control	25	2		
Structures stability			30	3
Turbomachines	98	8		
<b>Interdisciplinary training</b>				
Corporate Analysis	15	2	15	2
English	20	2	20	2
Environmental aspects of the production techniques	30	2		
Communication	15	2	15	2
Corporate Economics			15	2
Entrepreneurship	15	2		
Ethics of the engineer			20	2
Quality management			15	2
Human resources management	30	2		
Introduction to integrated logistics			15	2
Maintenance			15	2
Manufacturing Management	30	2		
Philosophy and science	25	2		
Factory visits and field trip abroad	25	2		
<b>Majors and option courses</b>				
Orientation(*)			155	12
Option courses			30	2
Professional integration				
Internship (13 weeks) and diploma thesis			360	24
<b>Total per column</b>	<b>735</b>	<b>60</b>	<b>735</b>	<b>60</b>

(\*) In 2010-2011, the following orientations are organized :  
Chemical industry, construction, electricity, electronics, mechanics, physics

2<sup>nd</sup> cycle

## MASTER IN INDUSTRIAL SCIENCES

### TRAINING

The master, in direct drive with the industrial world, proposes traditional activities of technical training as well as management, economy, ethics, ... lessons but also some enterprise visits, an internship (minimum 13 weeks), a final thesis, possibilities of European exchanges, ... Unanimously recognized assets for a professional future with very broad horizons.

### CAREER PROSPECTS

Companies, either industrial or services ones, need executives for a wide range of technical jobs where the scientific culture is a reference and where a competence to approach the human aspects is of paramount importance.

The engineer, far from being "locked up" in technical matters, can practice his activity in the many fields met in the industry, for example economic management and human resources management.

To take an example and without being exhaustive, we can mention both SMEs and multinationals, the public or private sectors, research, education, ... without forgetting the ones who have got a spirit for enterprise and founded their own business.

The job also provides an opportunity to meet fascinating people, also beyond our borders.

### INTERNSHIP

In the last year of studies, the student will carry an internship and final thesis in a company.

This is the acme in the engineer's curriculum.

During a minimum period of 13 weeks starting in February, the student, whose academic training is finished, carries out a professional integration activity that leads to the fulfillment of a master thesis which will be orally presented. This second training period constitutes a real contribution for companies which can in this way know and assess students at the end of their initial training.

### STRONG POINTS

HELMo Gramme trains polyvalent industrial engineers. They are thus able to deal with all kinds of technical problems, management and human relationships. HELMo Gramme has also the ambition to train industrial engineers who will be operational at the end of their studies. Therefore, our training is oriented, among other things, towards projects-oriented learning. All the training is organized in straight collaboration with the industry.



Master in Industrial Engineering Sciences

# GRAMME, our values !



## Educational methods

Our educational methods are based on proximity and accessibility to the teaching staff. The difficulty is meant to be progressive in the first year and more and more project-oriented in the following years.

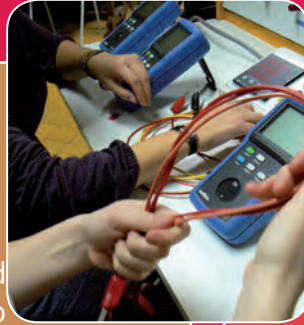
It is moreover essentially **inductive**: from a concrete case of study, we elaborate a theoretical pattern which aims at being used in other contexts.

Theory is not a purpose in itself but is always linked to a practical application.

A most peculiar attention is devoted to **students who have problems** particularly in the first year (problem-solving sessions, monitoring sessions of accompanied work, tutorship etc...)

Finally underlying these features concerning content and educational methods, there is the Gramme motto: "**Knowledge to Serve**" and **the human and christian values** which have always inspired us and which are a real corporate culture:

- **freedom** : a training which develops autonomy and the ability to make decisions by oneself in conscience and responsibility
- **subsidiarity** : decisions are made at the lowest possible scale of hierarchy, which means the nearest to the environment to which they will be applied which develops responsibility, participation and solidarity; in this framework students are asked to have an active role in the various councils where management and the future of the Institute are being discussed
- **attention to the weakest and solidarity** towards students (among others: availability) but also between members of the teaching staff ( collaboration and support instead of competitiveness)
- **service consciousness** : training engineers whose ambition is to serve society.



## Content of the training

Contrary to a general trend which would lead to a higher and higher specialization of trainings, **polyvalence** has always been our particular feature and our strong point.

On the other hand, beyond the implementation of a solid theoretical basis, we must point out the importance of labs, exercises and projects sessions which can be found throughout the whole training in perfect symbiosis with theoretical lessons as well as internships (BAC3 and Master 2).

And last but not least, a whole series of **general training lessons** (languages, philosophy, ethics, socio-economy, communication, etc.) give our students, all along their academic training, an appreciated and famous open-mindedness.





## IN THE ENVIRONMENT OF GRAMME, YOU CAN ALSO FIND :

### Students' participation in various technical and economical competitions

Without being exhaustive, let us mention some recent participations in competitions that have been crowned with success :

"Faites le pont", SKF, L'Oréal Ingenius Contest, the «Eurobot» robotics project Shell Eco Marathon, Cera awards, Starters academy, ...

### A research center

The CRIG initially "Centre de Recherche de l'Institut Gramme" is now the research center of the whole high school; most young researchers, who work there, are from the Institute, the recent research work has promoted the creation of new companies.

### The PLC Institut Gramme

It's a place where the evolution of the Institute is thought about. Grants are also allowed to graduates for post-graduate trainings

### The CEG (Comité des Etudiants de Gramme)

This students' committee manages the students' representation in the management organs of the college, ensures mentoring of 1st - year students, circulation of class notes, ...

### The Union Gramme

The association of graduate engineers of the Gramme Institute, is a PLC that aims at rallying all the engineers from the Institute, creating a friendly relationship and a sense of collegiality, which can help find a place in industry and develop scientific, technical and social knowledge.

The Union Gramme often helps in various ways in the framework of new projects or industrial integration.

### Measures for an active learning

The Gramme Institute implements concrete measures to improve the support of first-year students in order to make the passage between secondary school and higher school easier.

These measures have to enable all the students to :

- find an adapted working method,
- play an active part during their training.

### Help to success in higher education

In the framework of the SARDES («Système d'Aide à la Réussite Dans l'Enseignement Supérieur») project developed with the assistance of the Social European funds, the Gramme Institute has created an Internet site <http://sardes.helmo.be> hosting three interactive foundation courses (algebra, trigonometry and analytic geometry) thought-out to make the transition from secondary school to higher education easier with a self-study that depends on the correlated difficulties and the achieved results during the tests punctuating each of the modules.

They allow the future BAC1 student to achieve the mastering of mathematics knowledge which is essential for a good understanding and success in scientific lessons of the first year of studies. However, they also offer the students the opportunity to review notions which they don't master by reaching the related module.

# List of accompanying measures



## LIST OF ACCOMPANYING MEASURES

### Preparatory courses

organized at the beginning of September.

### Refresher courses

organized at the beginning of the first term concerning learning methods in order to make the transition between secondary school and higher education easier.

### Monitoring

allowing all students to get advice from a free chosen teacher.

### Answers to the students' questions :

- during and after courses and practical work,
- on Wednesday from 11.30 to 13.30 with suspension of courses,
- at any other time following the availability of the teacher,
- during private study periods organized before the exams.

### Guidance to make personal undertaking easier by :

- work sheets available for students in order to better prepare exercises sessions and to be more actively involved,
- free and weekly sessions of accompanied work during which students can solve exercises they can't tackle with a teacher's help.

### Adapted educational methods :

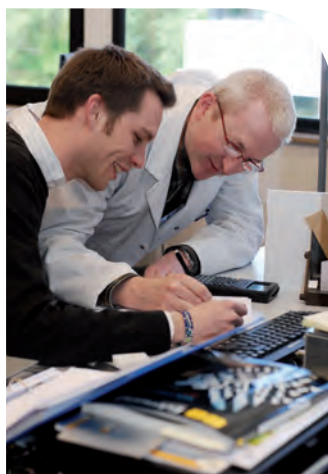
- "proximity" educational methods during the exercises sessions with the wish of being in touch with the students in order to spot their gaps,
- concern to give concrete expression to subjects even the most abstract ones during theoretical courses,
- links between each theoretical course and related exercises sessions,
- links between different theoretical courses.

### Continuing assessment for some courses, e.g. :

- assessed exercises during exercises sessions,
- non-penalizing tests during the first semester,
- summary tests in January and during the second semester,
- posting of the answers of examinations and handing out of scripts to all students,
- posting of the answers of the exams and possible consultation of scripts.

### HELMo educational accompanying service :

- individual meetings,
- distance monitoring.



**Enrolment period** : till 8th July and from 16th August. From Monday to Friday from 9 am to 12 am and from 2 pm to 5 pm.  
Courses are starting on 15th September 2011.

## Admission requirements

Graduated from a secondary school :  
Secondary Education Certificate.  
Graduated from a Higher school or coming from another country than Belgium :  
please contact the students' secretary's office.

## Documents needed forenrolment

- A copy of your ID (both sides).
- Birth certificate
- A top copy of the Secondary Education Certificate or the top temporary document.
- The certifications covering the performed years between the end of the secondary education and the enrolment.
- An ID size picture.
- A composition of the family dated after 1st July 2011 for foreign students.

## Enrolment fees

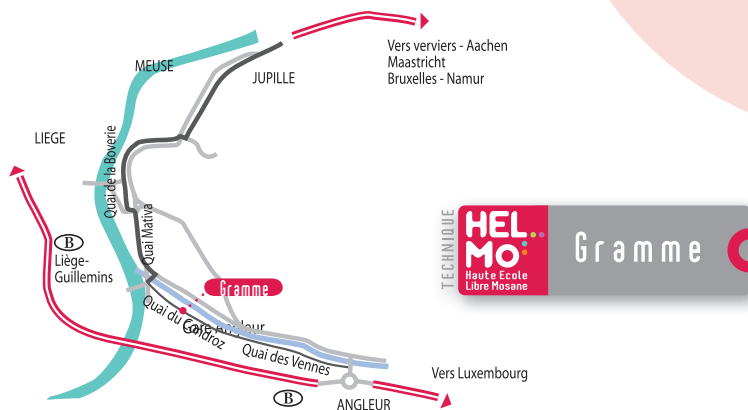
The enrolment fees include the French Community part as well as some additional costs. The enrolment fees are 720,86\* € per school year.

\*The mentioned amounts are indicative for Belgian and European students who haven't been allowed a grant and for non-graduating years. Those amounts are updated every year. This document has no contract value. As soon as you are registered you must pay a deposit by bank transfer.

In case of financial problems, the Social Department of HELMo offers several possibilities of grants as well as spreading of payments.



On <http://inscription.helmo.be> ( from April 30th for the next academic year)



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### Legal mention :

The High Scholl HELMo has brought the greatest care to the writing of the present document. The High School HELMo cannot however guarantee the exactness of information. The reader must also be aware that the presented information could be modified without prior notice. So timetables can be annually modified with sometimes considerable changes which are always submitted to the approval of the French Community.



# HELMo

## Haute Ecole Libre Mosane

33 TRAININGS • 13 INSTITUTES

PEDAGOGIC

PARAMEDICAL

SOCIAL

ECONOMIC

TECHNICAL

My strong point !

### TRAININGS

- Kindergarten teacher
- PE teacher
- Primary school teacher
- Secondary school teacher
- Family and social economy
- French
- Germanic languages
- Mathématiques
- Sciences
- Human sciences
- Economic sciences and applied economic sciences
- Specialized teacher
- Specialization in psychomotricity
- Specialization in orthopedagogy
- Bachelor in nursing
- Midwife
- Specialization in paediatrics
- Specialization in community health
- Spec. in MEMS
- Master in social action and engineering
- Social worker
- Bachelor in accounting
- Bachelor in marketing
- Bachelor in insurances
- Bachelor in international trade
- Bachelor in law
- Management assistant, administration - enterprise option
- Management assistant, languages option
- Bachelor in automatics
- Bachelor in computer sciences
- Bachelor in medical biology
- Bachelor in technical salesman
- Dress designer
- Master in industrial engineering

### Our INSTITUTES

- HELMo CFEL (Liège) - Tel.: 04 / 343 64 83
- HELMo Education Physique (Loncin) - Tel.: 04 / 247 43 38
- HELMo ESAS (Liège) - Tel.: 04 / 344 59 79
- HELMo Gramme (Angleur) - Tel.: 04 / 340 34 30
- HELMo Huy - Tel.: 085 / 21 60 81
- HELMo Mode (Liège) - Tel.: 04 / 223 64 42
- HELMo Sainte-Croix (Liège) - Tel.: 04 / 223 26 28
- HELMo Sainte-Julienne (Liège) - Tel.: 04 / 223 30 77
- HELMo Saint-Laurent (Liège) - Tel.: 04 / 349 50 51
- HELMo Sainte-Marie (Liège) - Tel.: 04 / 229 86 50
- HELMo Saint-Martin (Liège) - Tel.: 04 / 223 42 74
- HELMo Saint-Roch (Theux) - Tel.: 087 / 54 29 70
- HELMo Verviers - Tel.: 087 / 30 00 92

