

FSA1BA - Introduction

Introduction

Introduction

After passing the admission test you will start your cursus with the bachelor's programme in Engineering Sciences [180]. This programme offers a basic science education and a specific training in Engineering sciences.

During the second annual unit, you will opt for two different trainings in specialized Polytechnics. These specialization tracks enable

FSA1BA - Teaching profile

Learning outcomes

General objectives

The bachelor's programme in Engineering Sciences : Engineering, leads to the degree of "Bachelor of Engineering Sciences : Engineering" of the French-speaking Community of Belgium. Upon successful completion of this first cycle of studies, the student will have access to one or several titles in Engineering Sciences, awarded by the Faculty of Applied Sciences, by doing one of the corresponding master's programmes.

The general objectives of the bachelor's programme in Engineering Sciences are, therefore, aimed at the acquisition of :

- lasting scientific knowledge : a solid grounding in the sciences as well as the practice and integration of previously acquired knowledge
- a solid basis in specialised studies, entitling access to a master's (either at UCL, within the French-speaking Community or abroad) : progressive orientation, one or two specialisations in Engineering Sciences
- high level competence and skills : analysis, critical spirit, self-evaluation, conception (of models, tools, systems, processes and procedures), sound written and oral communication skills and professional team-work qualities. The programme is designed to integrate the necessary skills within a pluridisciplinary context (including the Human Sciences, Ethics, the Environment and Sustainable Development).

On successful completion of this programme, each student is able to :

démontrer la maîtrise d'un corpus de connaissances en sciences fondamentales et polytechniques, lui permettant de résoudre des problématiques disciplinaires cadrées (Axe 1).

1.1. Appliquer les concepts, lois, raisonnements à une problématique disciplinaire de complexité cadrée.

1.2. Décrire des outils de modélisation et de calcul adéquats pour résoudre une problématique disciplinaire cadrée.

d'organiser et de mener à son terme une démarche d'ingénierie appliquée au développement d'un produit (et/ou d'un service) répondant à un besoin ou à une problématique cadrée, à l'analyse d'un phénomène physique donné, un système (Axes 2 et 3).

2.1. Décrire et formuler le problème à résoudre ou le besoin fonctionnel sous la forme d'un cahier des charges générique.

2.2. Se documenter sur l'état des connaissances actuelles dans le domaine de la problématique posée.

2.3. Poser des hypothèses de travail pour la modélisation d'une problématique cadrée.

The student has the possibility of choosing two courses in engineering sciences, each in a different orientation. The purpose of this dual track system is to enable students who so wish to have basic training in two engineering science specialities, increasing their technical versatility, or preparing for a master's degree in civil engineering in a field relating to several of the basic orientations offered at the level of the bachelor's program. The distribution of volumes for polytechnic courses is 10 credits in the second annual block and 20 credits in the third annual block.

The student has the possibility to replace one of the specialization tracks by [an accessible opening minor](#).

The seven different specialization tracks in Engineering Sciences are :

- 1. Biomedical Engineering:** The aim of this track is initiating the students to the multidisciplinary field of biomedical engineering. First, this requires an introduction to the different disciplines of life sciences (biology, anatomy, biochemistry, etc.). Next, a familiarization with fundamental challenges from the different pillars of biomedical engineering will be provided (bioinstrumentation, biomaterials, biomechanics, artificial organs, medical imaging, biological systems modeling, etc.). The students will then be able to deploy these skills in order to solve basic problems in biomedical engineering.
- 2. Civil Engineering:** The aim of this track is initiating the students to the basic concepts of civil engineering. In addition to the theoretical fundamentals about structures, materials, soil mechanics and hydraulics, the students will be immersed in the "civil engineering culture" and will acquire concrete experience by practical and laboratory works, basic projects and site visits.
- 3. Electricity:** The aim of this track is initiating the students to the basic concepts of electrical sciences and providing them the fundamental notions in the scientific and technical fields linked to electricity and its applications. More precisely the students will discover the fundamentals of electromagnetics and physical phenomena forming the basis of electronic devices working ; as well as the basic concepts of electronics, telecommunications, and electrodynamic converters.
- 4. Mechanics:** The aim of this track is to enable the students to increase and broaden their knowledge and skills in different areas of Mechanical Engineering. More specifically, this programme offers the students the opportunity to build a solid background knowledge of continuum mechanics (fluid and solid mechanics) and thermodynamics, both from the theoretical and the applied standpoints. Further, it offers applied but rigorous training in machine design, analysis of machine components and manufacturing. Finally, this programme allows the students to develop a strong expertise in mathematical modelling and methods for numerical simulation.
- 5. Computer science:** The aim of this track is to enable the students to master the basic concepts in the field of computer sciences. More precisely this specialization trains the students to acquire basic fundamentals in computer sciences (algorithmic and data structures, computer languages, informatic systems, databases); and the capacity to analyze and solve algorithmic problems by applying its knowledge in the field of computer and engineering sciences.
- 6. Applied Mathematics:** The aim of this track is to enable the students to increase and improve their knowledge and skills in various fields of applied mathematics and to understand their basic concepts. More precisely this specialization trains the students in the design, analysis and implementation of mathematical models for engineering sciences in the industry, and in the elaboration of effective strategies to optimise their performance.
- 7. Applied Chemical and Physics:** The aim of this track is to enable the students to build a broad knowledge skills base in applied chemistry and physics (including thermodynamics and kinetics) opening avenues to the main fields of chemical and environmental engineering, advanced materials engineering, as well as physical engineering. The acquired skills cover a wide range of physical scales, from atomic to macroscopic and industrial dimensions, and prepare to the professions of the engineering master in chemistry and materials science swell as the master in physical engineering (chemical and environmental engineering, sustainable chemistry and energy, nanotechnology, (nano)electronics, optics, advanced materials including biomaterials, sensors and transducers, etc.).

FSA1BA Programme

Detailed programme by subject

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

1 2 3

○ Obligatory Courses (120 credits)

○ General Courses (120 credits)

All the students attend all these courses.

<p>○ LEPL1101</p>	
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				Year		
				1	2	3
○ LEPL1301	Chemistry and Physical chemistry 1	Sophie Demoustier Alain Jonas (compensates) Francesco Contino Bernard Nysten	FR [q2] [30h+30h] [5 Credits] 🌐	x		
○ LEPL1302	Chemistry and Physical chemistry 2	Hervé Jeanmart Joris Proost	FR [q1] [30h+30h] [5 Credits] 🌐		x	
○ LEPL1402	Informatics 2 🟡	Sébastien Jodogne Ramin Sadre Pierre Schaus	FR [q1] [30h+30h] [5 Credits] 🌐		x	

○ Non-disciplinary Courses

○ Cours au choix (3 credits)

Les étudiants choisissent un cours parmi

⊗ LEPL1804	Sustainable development and transition	David Bol (compensates) Hervé Jeanmart Patricia Luis Alconero Patricia Luis Alconero (compensates) Hervé Jeanmart Xavier Marichal Xavier Marichal (compensates) Hervé Jeanmart Jean-Pierre Raskin Jean-Pierre Raskin (compensates) Hervé Jeanmart	FR [q1] [22.5h+15h] [3 Credits] 🌐			x
⊗ LEPL1805	People management	Bauduin Auquier Philippe Henrotaux Renaud Ronsse	FR [q1] [22.5h+15h] [3 Credits] 🌐			x

○ Cours obligatoires (8 credits)

The students attend these two courses

○ LEPL1801	Engineering ethics	Alexandre Guay	FR [q1] [22.5h+15h] [3 Credits] 🌐	x		
○ LEPL1803	Economy	Olivier Daxhelet Julien Hendrickx	FR [q2] [30h+30h] [5 Credits] 🌐	x		

○

EN [q1] [30h] [2 Credits]

Year

			1	2	3
<p>○ LANGL1171</p> <p>Anglais pour ingénieurs civils I</p> <p><i>A placement test is organized at the beginning of the annual unit 1 and 2. Depending on the obtained mark, the students follow an adapted course. The students with a mark greater or equal to 16/20 keep their mark and could take an additional language course (out of the 180 credits); this additional course will only affect their average mark if credited (mark greater or equal to 10/20)</i></p>	<p>Charline Coduti (compensates Anne-Julie Toubeau)</p> <p>Hila Peer</p> <p>Marc Piwnik</p> <p>Nevin Serbest (coord.)</p>	<p>EN [q1] [12h] [2 Credits]</p>	x		
<p>○ LANGL1272</p> <p>Anglais pour ingénieurs civils II</p> <p><i>A placement test is organized at the beginning of the annual unit 1 and 2. Depending on the obtained mark, the students follow an adapted course. The students with a mark greater or equal to 16/20 keep their mark and could take an additional language course (out of the 180 credits); this additional course will only affect their average mark if credited (mark greater or equal to 10/20)</i></p>	<p>Jean-Luc Delghust</p> <p>Adrien Kefer</p> <p>Sabrina Knorr</p> <p>Charlotte Peters (coord.)</p> <p>Marc Piwnik (coord.)</p>	<p>EN [q1] [30h] [3 Credits]</p>		x	
<p>○ LANGL1373</p> <p>English for engineers 3</p>	<p>Ahmed Adriouèche (coord.)</p> <p>Stéphanie Brabant</p> <p>Nicholas Gibbs</p> <p>Ariane Halleux</p> <p>Sandrine Meirlaen</p> <p>Yannick Paquin</p> <p>Charlotte Peters (coord.)</p> <p>Nevin Serbest</p> <p>Florence Simon</p>	<p>EN [q1] [30h] [2 Credits]</p>			x

⊗ Dutch courses

<p>⊗</p> <p>LNEER1300</p>	<p>General and academic Dutch - intermediate level</p>	<p>Hilde Bufkens (coord.)</p> <p>Isabelle</p> <p>Demeulenaere (coord.)</p>
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⊗ LTECO2200



Course prerequisites

The **table** below lists the activities (course units, or CUs) for which there are one or more prerequisites within the programme, i.e. the programme CU for which the learning outcomes must be certified and the corresponding credits awarded by the jury before registering for that CU.

These activities are also identified **in the detailed programme**: their title is followed by a yellow square.

Prerequisites and student's annual programme

As the prerequisite is for CU registration purposes only, there are no prerequisites within a programme year. Prerequisites are defined between CUs of different years and therefore influence the order in which the student will be able to register for the programme's CUs.

In addition, when the jury validates a student's individual programme at the beginning of the year, it ensures its coherence, meaning that it may:

- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.
- transform a prerequisite into a corequisite if the student is in the final year of a degree course.

For more information, please consult the [Academic Regulations and Procedures](#).

Prerequisites list

LANGL1272 "Anglais pour ingénieurs civils II" has prerequisite(s) LANGL1171

- LANGL1171 - [Anglais pour ingénieurs civils I](#)

LEPL1402 "Informatics 2" has prerequisite(s) LEPL1401

- LEPL1401 - [Informatics 1](#)

The programme's courses and learning outcomes

For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the skills expected of every graduate on completion of the programme. Course unit descriptions specify targeted learning outcomes, as well as the unit's contribution to reference framework of learning outcomes.

Detailed programme per annual block

FSA1BA - 1ST ANNUAL UNIT

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
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- Activity with requisites
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[FR]

○ LEPL1201	Physics I	Laurent Francis Dimitri Lederer Vincent Legat Thomas Pardoën	PK [q1] [30h +30h] [5 Credits]
○ LEPL1501	Project 1	Xavier Bollen (comp l 1 1 l h W n 1 G [] 0 d	

⌘ LALLE1102	German beginner's level 2nd part (A1 - A2)	Caroline Klein (coord.)	DE [q2] [45h] [2 Credits] 🌐
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⌘ Spanish Courses

⌘ LESPA1101	Spanish beginner's level 1st part (0-A1)	Begona Garcia Migura Fernando Juan San Basilio Pardo Alicia Maria Tirado Fernandez (coord.)	ES [q1 or q2] [45h] [2 Credits] 🌐
⌘ LESPA1102	Spanish (beginner;s level) 2nd part (A1 - A2)	Alicia Maria Tirado Fernandez (coord.)	ES [q1 or q2] [45h] [2 Credits] 🌐

FSA1BA - 2ND ANNUAL UNIT

- Mandatory
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⌘ LESPA1301	Spanish intermediate level, 1st part (A2-B1.1)	Begona Garcia Migura (coord.)	ES [q1 or q2] [45h] [3 Credits]
⌘ LESPA1302	Spanish intermediate level, 2nd part (B1.1-B1.2)	Alicia Maria Tirado Fernandez (coord.)	ES [q2] [45h] [3 Credits]

o Religion courses for students in exact sciences

The students select one course between:

⌘ LTECO2100	Sociétés, cultures, religions : Biblical readings	Hans Ausloos	FR [q1] [15h] [2 Credits]
⌘ LTECO2300	Societies, cultures, religions : Ethical questions	Marcela Lobo Bustamante	FR [q1] [15h] [2 Credits]
⌘ LTHEO2840	Science and Christian faith	Benoit Bourguine Paulo Jorge Dos Santos Rodrigues	FR [q1] [15h] [2 Credits]
⌘ LTECO2200	Societies-cultures-religions : Human Questions	Pedro Dusabamahoro Valinho Gomes	FR [q1] [15h] [2 Credits]

o Minor or additional module

Maximum 2 element(s)

⌘ LEPL1508	Project 4 (in electricity)	Christophe Craeye (coord.) Dimitri Lederer Luc Vandendorpe	FB [q2] [30h +22.5h] [5 Credits] 🌐
⌘ LEPL1509	Project 4 (in informatics)	Hélène Verhaeghe	FB [q2] [30h +22.5h] [5 Credits] 🌐
⌘ LEPL1510	Project 4 (in construction)	Pierre Latteur	FB [q2] [30h +22.5h] [5 Credits] 🌐
⌘ LEPL1511	Project 4 (in business projects creation)	Julien Hendrickx (coord.)	FB [q2] [30h +22.5h] [5 Credits] 🌐
⌘ LSST1001	IngénieursSud	Stéphanie Merle Jean-Pierre Raskin	FB [q1+q2] [15h +45h] [5 Credits] 🌐

○ Language Courses

○ English courses

○ LANGL1373	English for engineers 3
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Teaching method

Les étudiant-e-s bacheliers ingénieur civil se voient proposer un programme basé sur la "pédagogie active" qui les amène à prendre une part active dans la gestion de leur formation. Des dispositifs pédagogiques variés sont mis en place chaque année de manière collégiale par les titulaires de cours et en collaboration avec la cellule de coordination pédagogique, et comportent des cours magistraux, des APP (apprentissage par problèmes et par projets), des séances d'exercices, des travaux individuels et de groupe.

In the context of the projects and certain other subject activities, the student will be closely followed in his studies throughout the whole process, in an effort to situate himself appropriately with respect to his individual work and group work and make any necessary readjustments. On the other hand, he will be evaluated during the course of the quadrimester (ongoing evaluation) and again at the end of the quadrimester for each of the subjects taken, to ascertain whether he fulfils the demands of the programme and has completed the modules concerned successfully. These evaluations are both written and oral. The specific details and procedures for the ongoing evaluation are explained at the beginning of each period of the study programme.

Possible trainings at the end of the programme

Access to the master's of Engineering Sciences - Engineering

The bachelor's programme in Engineering entitles direct access to the master's programme in Engineering, in the orientation corresponding to one of the specialization tracks followed (otherwise prerequisites could be required)

After having accumulated 120 credits spread over 2 years, the student will obtain the title of Master of Engineering Sciences, which is conferred jointly with the professional title of Engineer.

The Ecole Polytechnique de Louvain offers ten different orientations for these studies :

- [Master \[120\] in Civil Engineering](#)
- [Master \[120\] in Chemical and Materials Engineering](#)
- [Master \[120\] in Physical Engineering](#)
- [Master \[120\] in Electrical Engineering](#)
- [Master \[120\] in Electro-mechanical Engineering](#)
- [Master \[120\] in Mechanical Engineering](#)
- [Master \[120\] in Computer Science and Engineering](#)
- [Master \[120\] in Mathematical Engineering](#)
- [Master \[120\] in Biomedical Engineering](#)
- [Master \[120\] in Data Science Engineering](#)
- [Master \[120\] in Energy Engineering](#)

Contacts

Curriculum Management

Entity

Structure entity	SST/EPL/BTCI
Denomination	(BTCI)
Faculty	Louvain School of Engineering (EPL)
Sector	Sciences and Technology (SST)
Acronym	BTCI
Postal address	Croix du Sud 1 - bte L6.11.01 1348 Louvain-la-Neuve

Academic supervisor: [Vincent Legat](#)

Jury

- Président du Jury: [Claude Oestges](#)
- Secrétaire du Jury: [Paul Fisette](#)

Useful Contact(s)

- Secrétariat: [Catherine Peeters](#)
- Academic advisor: [Isabelle Poty](#)
- Academic advisor: [Paul Fisette](#)

