FSA1BA - Teaching profile

Learning outcomes

General objectives

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 fundaments 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 fundaments 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 fundaments 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.

LEPL1803

				Year 1	2	3
LEPL1503	Project 3	Olivier Bonaventure Benoît Legat	FR [q2] [30h+30h] [5 Credits]		x	
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 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	[illegible]uduin Auquier [illegible]ppe 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						

Year
1 2 3

LTHEO2840

List of available minors

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 puposes 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.

 # Prerequisities list

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

- LANGL1171 - Anglais pour ingénieurs civils I

LEPL1402 "Informatique 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 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
- Not offered in 2024-2025 or the following year
- Activity with requisites
- Open to incoming exchange students
- Not open to incoming exchange students
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Click on the course title to see detailed informations (objectives, methods, evaluation...)

Obligatory Courses

⊠ LALLE1102	German beginner's level 2nd part (A1 - A2)	Caroline Klein (coord.)	15h [q2] [45h] [2 Credits]

⊠ Spanish Courses

⊠ LESPA1101	Spanish beginner's level 1st part (0-A1)	Begona Garcia Migura Fernando Juan San Basilio Pardo Alicia Maria Tirado Fernandez (coord.)	15h [q1 or q2] [45h] [2 Credits]

⊠ 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]

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	Benoît Bourgine 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]

Minor or additional module

Maximum 2 element(s)

FSA1BA - 3RD 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
- 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...)

Obligatory Courses

General Courses

All the students attend all these courses.

LEPL1109	Statistics and data sciences	Donatien Hainaut Laurent Jacques	FR [q1] [30h +30h] [5 Credits]

⊠ LEPL1508	Project 4 (in electricity)	Christophe

FSA1BA - Information

Access Requirements

Decree of 7 November 2013 defining the landscape of higher education and the academic organization of studies.
The admission requirements must be met prior to enrolment in the University.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

General access requirements

Except as otherwise provided by other specific legal provisions, admission to undergraduate courses leading to the award of a Bachelor's degree will be granted to students with one of the following qualifications :

1. A Certificate of Upper Secondary Education issued during or after the 1993-1994 academic year by an establishment offering full-time secondary education or an adult education centre in the French Community of Belgium and, as the case may be, approved if it was issued by an educational institution before 1 January 2008 or affixed with the seal of the French Community if it was issued after this date, or an equivalent certificate awarded by the Examination Board of the French Community during or after 1994;

2. A Certificate of Upper Secondary Education issued no later than the end of the 1992-1993 academic year, along with official documentation attesting to the student's ability to pursue higher education for students applying for a full-length undergraduate degree programme;

3. A diploma awarded by a higher education institution within the French Community that confers an academic degree issued under the above-mentioned Decree, or a diploma awarded by a university or institution dispensing full-time higher education in accordance with earlier legislation;

4. A higher education certificate or diploma awarded by an adult education centre;

5. A pass certificate for one of the entrance examinations organized by higher education institutions or by an examination board of the French Community; this document gives admission to studies in the sectors, fields or programmes indicated therein;

6. A diploma, certificate of studies or other qualification similar to those mentioned above, issued by the Flemish Community of Belgium, the German Community of Belgium or the Royal Military Academy;

7. A diploma, certificate of studies or other qualification obtained abroad and deemed equivalent to the first four mentioned above by virtue of a law, decree, European directive or international convention;

Note:

Requests for equivalence must be submitted to the Equivalence department (Service des équivalences) of the Ministry of Higher Education and Scientific Research of the French Community of Belgium in compliance with the official deadline.

The following two qualifications are automatically deemed equivalent to the Certificate of Upper Secondary Education (Certificat d'enseignement secondaire supérieur – CESS):

- European Baccalaureate issued by the Board of Governors of a European School,

- International Baccalaureate issued by the International Baccalaureate Office in Geneva.

8. Official documentation attesting to a student's ability to pursue higher education (diplôme d'aptitude à accéder à l'enseignement supérieur - DAES), issued by the Examination Board of the French Community.

Specific access requirements

- Access to bachelor programmes for candidates of nationality outside the European Union who are not assimilated to Belgian nationals is subject to the following criteria:
  - not have obtained a secondary education diploma for more than 3 years maximum. Example: for an admission application for the academic year 2024-2025, you must have obtained your diploma during the academic years 2021-2022, 2022-2023 ou 2023-2024. In the French Community of Belgium, the academic year runs from September 14 to September 13
  - not already hold an undergraduate degree
- Candidates, whatever their nationality, with a secondary school diploma **from a country outside the European Union**, must have obtained an average of 13/20 minimum or, failing that, have obtained this average, have passed one year of study in Belgium (for example special Maths / sciences). A non-successful year will not be taken into consideration.

- For any secondary school diploma **from a European Union country**, the admission request must contain the equivalence of your diploma or, at the very least, proof of the filing of the equivalence request with the Wallonia-Brussels Federation (French Community of Belgium). For any information relating to obtaining an equivalence, please refer to the following site.
- For any secondary school diploma **from a country outside the European Union**, the admission application must contain the equivalence of your diploma issued by the Wallonia-Brussels Federation (French Community of Belgium). If you have a restrictive equivalence for the programme of your choice, in addition of it, you **must** have either the DAES or a certificate of successful

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 Polythechnique de Louvain offers ten different orientations for theses 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: Dimitri Lederer

Jury

- Président du Jury: Claude Oestges
- Secrétaire du Jury: Paul Fisette

Useful Contact(s)

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- Academic advisor: Isabelle Poty
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