FSA1BA
2018 - 2019
Bachelor in Engineering

⚠️ The version you're consulting is not definitive. This programme still may change. The final version will be published on 1th June.

At Louvain-la-Neuve - 180 credits - 3 years - Day schedule - In french
Dissertation/Graduation Project: NO - Internship: NO
Activities in English: NO - Activities in other languages: NO
Activities on other sites: NO
Main study domain: Sciences de l'ingénieur et technologie
Organized by: Ecole Polytechnique de Louvain (EPL)
Programme code: fsa1ba - Francophone Certification Framework: 6

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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 scientific formation and a specific formation in Engineering sciences.

During the second annual unit, you will opt for two different trainings in specialized Polytechnics. These specialization tracks aim to enable you to acquire a basic training in two specialties in Engineering Sciences and to prepare you for a corresponding master. Seven different specialization tracks are organized in Engineering Sciences: Applied Chemistry and Physics, Construction, Electricity, Computer Sciences, Biomedical Engineering, Applied Mathematics and Mechanics.

The student has the possibility to replace one of these tracks by an accessible opening minor.

Your profile

Following a strong mathematical and scientific formation during high school is recommended.

Your future job

Civil engineers are present in all industrial sectors: the chemical industry, pharmaceutical and food industries, electronics and telecommunications industries, metallurgy, aeronautics, construction and engineering, large scale distribution, banking and consulting services, nanotechnologies and medical technologies, etc.

They play a role as researchers and developers, are responsible for production or management and hold jobs in marketing and sales (of advanced technological products).

We find civil engineers in departments of finance, information technology, training or quality control, the public sector, higher education, or in the Ministry of equipment and transportation. ( www.fabi.com )

Your programme

The programme offers :

• a deep scientific formation : mathematics, physics, chemistry, computer science, numerical computation, probabilities and statistics, ...
• a problem-based learning in small groups,
• a training for analyzing a concrete problem, looking for missing items, and developing your own solutions,
• engineering projects management, from the conception to the realization,
• high-level skills: analysis, discernation, communication, team work, conception in a pluridisciplinary context.

Once bachelor, you will continue your training by one of the following Masters: Biomedical Engineering, Chemical and Materials Engineering, Civil Engineering, Computer science, Data Sciences Engineering, Physical Engineering, Mechanical Engineering, Electrical Engineering, Electro-mechanical Engineering, Mathematical Engineering.
Programme structure

This programme applies to students enrolled for the first time in this programme in 2018-2019, or already enrolled in 2017-2018 but with less than 45 credits obtained. For the others, see https://uclouvain.be/prog-2017-fsa1ba-structure

The bachelor's programme in Engineering Sciences: Engineering, totals 180 credits spread over 3 years:

- A basic scientific formation of 120 credits,
- Two specialized formations of 30 credits (one of these specialization tracks can be replaced by an opening minor in another Faculty).

The student opts for two different trainings in specialized Polytechnics. The aim of this double specialization track in Polytechnics is to enable the student to acquire a basic training in two specialties in Engineering Sciences, thus increasing his technical polyvalence, or to prepare for a master in Engineering Sciences situated mid-way between the basic orientations at the bachelor's level. The dividing up of the work volumes for the options in Polytechnics are equivalent to 10 credits in the second year and 20 credits in the third year.

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 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 Detailed programme

#### General core programme by subject

#### Obligatory Courses (120 credits)

**General Courses (120 credits)**

*All the students attend all these courses.*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1101</td>
<td>Algebra</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1102</td>
<td>Analyse I</td>
<td>5</td>
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<tr>
<td>LEPL1201</td>
<td>Physique I</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
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<tr>
<td>LEPL1501</td>
<td>Projet 1</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1401</td>
<td>Informatique I</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1103</td>
<td>EDPs et analyse complexe</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1104</td>
<td>Méthodes numériques</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1105</td>
<td>Analyse II</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1106</td>
<td>Signaux et systèmes</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1202</td>
<td>Physique II</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1203</td>
<td>Physique III</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1108</td>
<td>Mathématiques discrètes et probabilité</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1109</td>
<td>Statistiques et sciences des données</td>
<td>5</td>
<td>30+30</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1110</td>
<td>Éléments finis</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1502</td>
<td>Projet 2</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1503</td>
<td>Projet 3</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1301</td>
<td>Chimie et chimie physique 1</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1302</td>
<td>Chimie et chimie physique 2</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
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<tr>
<td>LEPL1402</td>
<td>Informatique 2</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
</tbody>
</table>

**Non-disciplinary Courses**

- **Cours au choix (3 credits)**
  *Les étudiants choisissent un cours parmi*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1804</td>
<td>Développement durable et transition</td>
<td>3</td>
<td>22.5+15</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1805</td>
<td>Gestion des personnes</td>
<td>3</td>
<td>22.5+15</td>
<td>1q</td>
</tr>
</tbody>
</table>

- **Cours obligatoires (8 credits)**
  *Les étudiants suivent tous ces deux cours*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1801</td>
<td>Ethique de l'ingénieur</td>
<td>3</td>
<td>22.5+15</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1803</td>
<td>Economie</td>
<td>3</td>
<td>30+30</td>
<td>2q</td>
</tr>
</tbody>
</table>

**3rd annual unit project**

*The students choose a project (corresponding to one of their specialization tracks) between:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1504</td>
<td>Projet 4 (en mécanique)</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1505</td>
<td>Projet 4 (en chimie et physique)</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1506</td>
<td>Projet 4 (en génie biomédical)</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1507</td>
<td>Projet 4 (en mathématiques appliqués)</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1508</td>
<td>Projet 4 (en électricité)</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1509</td>
<td>Projet 4 (en informatique)</td>
<td>5</td>
<td>30+30</td>
<td>2q</td>
</tr>
</tbody>
</table>
Year: 1 2 3

### Language Courses (7 credits)

- **English courses**
  A placement test is organized at the beginning of the annual unit. Depending on the obtained mark, the students follow an adapted course based on their competence level. 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).

- **Dutch courses**
  - LNEER1300 General and academic Dutch - intermediate level
  - LNEER1500 Interfaculty teaching unit - General and academic Dutch - upper-intermediate level
  - LNEER2500 Seminar of Entry to professional life in Dutch - intermediate level

- **German courses**
  - LALLE1100 German - Elementary level
  - LALLE1300 General German - Upper-intermediate
  - LALLE1500 General German - Advanced

- **Spanish Courses**
  - LESPA1100 Spanish (beginner’s level) 0-A2
  - LESPA1300 Spanish middle level
  - LESPA1500 Spanish Advanced level (B1.2, B2.1)
  - LESPA1101 Spanish beginner’s level 1st part (0-A1)

- **Other language courses**
  The student could propose a course in another language.

- **Religion courses for students in exact sciences (2 credits)**
  The students choose one course between:
  - LTECO2100 Spirituality, culture, society - Biblical readings
  - LTECO2200 Spirituality, culture, society - reflections about Christian faith
  - LTECO2300 Spirituality, culture, society - questions about ethics

- **Religion courses for students in exact sciences - Advanced level (2 credits)**
  The students choose one course between:
  - LTECO2400 Spirituality, culture, society - reflections about Christian faith
  - LTECO2500 Spirituality, culture, society - questions about ethics

- **Specialization tracks (60 credits)**
  The students choose two specialization tracks (or one specialization track and one opening minor) between

- **Applied Chemistry and Physics (30 credits)**
  - LMECA1901 Continuum mechanics.
  - LMAPR1805 Introduction to materials science
### Statistical & Quantum Physics
- **Course:** LMAPR1491
- **Title:** Statistical & Quantum Physics
- **Instructors:**
  - Jean-Christophe Charlier
  - Xavier Gonze (coordinator)
  - Aurélien Lherbier (compensates Jean-Christophe Charlier)
  - Luc Piraux
  - Gian-Marco Rignanese
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Organic Chemistry
- **Course:** LMAPR1230
- **Title:** Organic Chemistry [M]
- **Instructors:**
  - Sophie Demoustier
  - Benjamin Elias
- **Credits:** 5
- **Hours:** 30h + 5h
- **Semester:** 1q

### Cinétique Thérmodynamique
- **Course:** LMAPR1400
- **Title:** Cinétique Thérmodynamique [M]
- **Instructors:**
  - Christian Bailly
  - Juray De Wilde (coordinator)
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q + 2q

### Materials Physics
- **Course:** LMAPR1492
- **Title:** Materials Physics
- **Instructors:**
  - Jean-Christophe Charlier
  - Xavier Gonze (coordinator)
  - Aurélien Lherbier (compensates Jean-Christophe Charlier)
  - Luc Piraux
  - Gian-Marco Rignanese
- **Credits:** 5
- **Hours:** 37.5h + 22.5h
- **Semester:** 2q

### Structural Materials and Geomaterials
- **Course:** LGCIV1031
- **Title:** Structural Materials and Geomaterials
- **Instructors:**
  - Christophe Craeye
  - Bruno Dehez
  - Claude Oestges (coordinator)
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Mechanics of Structures
- **Course:** LGCIV1022
- **Title:** Mechanics of Structures
- **Instructors:**
  - Christophe Craeye
  - Bruno Dehez
  - Claude Oestges (coordinator)
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Construction Stability
- **Course:** LGCIV1023
- **Title:** Construction Stability [M]
- **Instructors:**
  - Benoît Pardoen
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q

### Soil Mechanics
- **Course:** LGCIV1072
- **Title:** Soil Mechanics
- **Instructors:**
  - Benoît Pardoen
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Hydraulic
- **Course:** LGCIV1051
- **Title:** Hydraulic
- **Instructors:**
  - Sandra Soares Frazao
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Project in Electricity 1: Electrical Circuits
- **Course:** LELEC1101
- **Title:** Project in Electricity 1: Electrical Circuits
- **Instructors:**
  - Christophe Craeye
  - Bruno Dehez
  - Claude Oestges (coordinator)
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Measurements and Electrical Circuits
- **Course:** LELEC1370
- **Title:** Measurements and Electrical Circuits
- **Instructors:**
  - Christophe Craeye
  - Bruno Dehez
  - Claude Oestges (coordinator)
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Basic Analog and Digital Electronic Circuits
- **Course:** LELEC1530
- **Title:** Basic Analog and Digital Electronic Circuits
- **Instructors:**
  - Denis Flandre
  - Jean-Didier Legat (coordinator)
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q

### Electricity: Advanced Topics
- **Course:** LELEC1755
- **Title:** Electricity: Advanced Topics
- **Instructors:**
  - Denis Flandre
  - Danielle Janvier
  - Claude Oestges
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q

### Electromechanical Converters
- **Course:** LELEC1310
- **Title:** Electromechanical Converters
- **Instructors:**
  - Bruno Dehez
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Telecommunications
- **Course:** LELEC1360
- **Title:** Telecommunications
- **Instructors:**
  - Luc Vandendorpe
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Biologie et Physiologie Cellulaire
- **Course:** LGBIO1111
- **Title:** Biologie et Physiologie Cellulaire
- **Instructors:**
  - Charles De Smet
  - Christophe De Vleeschouwer
  - Pascal Kienlen-Campard
- **Credits:** 5
- **Hours:** 30h + 15h
- **Semester:** 2q

### Introduction to Biomedical Engineering
- **Course:** LGBIO1112
- **Title:** Introduction to Biomedical Engineering
- **Instructors:**
  - Philippe Lefèvre
- **Credits:** 5
- **Hours:** 45h
- **Semester:** 2q

### Anatomie et Physiologie des Systèmes
- **Course:** LGBIO1113
- **Title:** Anatomie et Physiologie des Systèmes
- **Instructors:**
  - Catherine Behets
  - Wydemans
  - Olivier Cornu
- **Credits:** 5
- **Hours:** 30h + 15h
- **Semester:** 1q

### Fundamentals of Neurophysiology and Neuropsychology in Motor Control and Motor Learning
- **Course:** LIEPR1024
- **Title:** Fundamentals of Neurophysiology and Neuropsychology in Motor Control and Motor Learning
- **Instructors:**
  - Julie Duque
  - Marcus Missal (coordinator)
- **Credits:** 5
- **Hours:** 45h
- **Semester:** 1q

### Biochimie I (Partim EPL)
- **Course:** LBIR1250A
- **Title:** Biochimie I (Partim EPL)
- **Instructors:**
  - 30h + 15h
- **Credits:** 5
- **Semester:** 2q

### Artificial Organs and Rehabilitation
- **Course:** LGBIO1114
- **Title:** Artificial Organs and Rehabilitation
- **Instructors:**
  - 30h + 30h
- **Credits:** 5
- **Semester:** 2q

### Paradigmes de Programmation et Concurrence [C]
- **Course:** LINFO1104
- **Title:** Paradigmes de Programmation et Concurrence [C]
- **Instructors:**
  - Pascal Kienlen-Campard
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q

### Conception orientée objet et gestion de données [C]
- **Course:** LINFO1225
- **Title:** Conception orientée objet et gestion de données [C]
- **Instructors:**
  - Pascal Kienlen-Campard
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q

### Systèmes informatiques [C]
- **Course:** LINFO1252
- **Title:** Systèmes informatiques [C]
- **Instructors:**
  - Pascal Kienlen-Campard
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q

### Algorithmique et structures de données [C]
- **Course:** LINFO1121
- **Title:** Algorithmique et structures de données [C]
- **Instructors:**
  - Pascal Kienlen-Campard
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 1q

### Réseaux informatiques [C]
- **Course:** LINFO1341
- **Title:** Réseaux informatiques [C]
- **Instructors:**
  - Pascal Kienlen-Campard
- **Credits:** 5
- **Hours:** 30h + 30h
- **Semester:** 2q
### Bachelor in Engineering [fsa1ba]

#### Applied Mathematics (30 credits)

<table>
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<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
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<tbody>
<tr>
<td>LINMA1315</td>
<td>Mathematical analysis : complements</td>
<td>5</td>
<td>2q</td>
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<tr>
<td>LINMA1702</td>
<td>Optimization models and methods I</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LINMA1170</td>
<td>Numerical analysis</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LINMA1691</td>
<td>Discrete mathematics - Graph theory and algorithms</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LINMA1510</td>
<td>Linear Control</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LINMA1731</td>
<td>Stochastic processes - Estimation and prediction</td>
<td>5</td>
<td>2q</td>
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#### Mechanics (30 credits)

<table>
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<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
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<tbody>
<tr>
<td>LMECA1210</td>
<td>Description et analyse des mécanismes</td>
<td>5</td>
<td>2q</td>
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<tr>
<td>LMECA1901</td>
<td>Continuum mechanics</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LMECA1100</td>
<td>Deformable solid mechanics.</td>
<td>5</td>
<td>1q</td>
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<tr>
<td>LMECA1321</td>
<td>Fluid mechanics and transfer phenomena.</td>
<td>5</td>
<td>2q</td>
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<td>1q</td>
</tr>
<tr>
<td>LMECA1855</td>
<td>Thermodynamics and energetics.</td>
<td>5</td>
<td>1q</td>
</tr>
</tbody>
</table>

#### Minor (30 credits)

The student can replace one of the specialization tracks by an opening minor from a list: https://uclouvain.be/prog-2018-fsa1ba-mineures
List of majors

- Majeure en génie biomédical [ en-prog-2018-fsa1ba-lmaj107j ]
- Majeure en chimie et physique appliquées [ en-prog-2018-fsa1ba-lmaj101j ]
- Majeure en construction [ en-prog-2018-fsa1ba-lmaj102j ]
- Majeure en électricité [ en-prog-2018-fsa1ba-lmaj103j ]
- Majeure en informatique [ en-prog-2018-fsa1ba-lmaj104j ]
- Majeure en mathématiques appliquées [ en-prog-2018-fsa1ba-lmaj105j ]
- Majeure en mécanique [ en-prog-2018-fsa1ba-lmaj106j ]

Majeure en génie biomédical [ FSA1BA-LMAJ107J ]

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Teacher(s)</th>
<th>ECTS</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGBIO1111</td>
<td>Biologie et physiologie cellulaire</td>
<td>Charles De Smet</td>
<td>30h</td>
<td>5</td>
<td>2q x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christophe De Vleeschouwer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pascal Kienlen-Campard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGBIO1112</td>
<td>Introduction to biomedical engineering</td>
<td>Philippe Lefèvre</td>
<td>45h</td>
<td>5</td>
<td>2q x</td>
</tr>
<tr>
<td>LGBIO1113</td>
<td>Anatomie et physiologie des systèmes</td>
<td>Catherine Behets</td>
<td>30h+15h</td>
<td>5</td>
<td>1q x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wydemans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Olivier Cornu</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>LIEPR1024</td>
<td>Fundamentals of neurophysiology and neuropsychology in motor control and motor learning</td>
<td>Julie Duque</td>
<td>45h</td>
<td>5</td>
<td>1q x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marcus Missal (coord.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGBIO1114</td>
<td>Artificial organs and rehabilitation</td>
<td></td>
<td>30h+30h</td>
<td>5</td>
<td>2q x</td>
</tr>
</tbody>
</table>
### Majeure en chimie et physique appliquées [ FSA1BA-LMAJ101J ]

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
<th>Hours</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMECA1901</td>
<td>Continuum mechanics.</td>
<td>5</td>
<td>30h+30h</td>
<td>1q</td>
</tr>
<tr>
<td>LMAPR1805</td>
<td>Introduction to materials science</td>
<td>5</td>
<td>45h+15h</td>
<td>2q</td>
</tr>
<tr>
<td>LMAPR1491</td>
<td>Statistical &amp; quantum physics</td>
<td>5</td>
<td>30h+30h</td>
<td>1q</td>
</tr>
<tr>
<td>LMAPR1230</td>
<td>Organic chemistry [M]</td>
<td>5</td>
<td>30h+5h</td>
<td>1q</td>
</tr>
<tr>
<td>LMAPR1400</td>
<td>Cinétique thermodynamique [M]</td>
<td>5</td>
<td>30h+30h</td>
<td>2q</td>
</tr>
<tr>
<td>LMAPR1492</td>
<td>Materials physics</td>
<td>5</td>
<td>37.5h+22.5h</td>
<td>2q</td>
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### Majeure en construction [ FSA1BA-LMAJ102J ]

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Credits</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGCIV1031</td>
<td>STRUCTURAL MATERIALS AND GEOMATERIALS</td>
<td>30+30h</td>
<td>2q</td>
</tr>
<tr>
<td>LGCIV1023</td>
<td>Construction stability [M]</td>
<td>30+30h</td>
<td>1q</td>
</tr>
<tr>
<td>LGCIV1072</td>
<td>Soil mechanics</td>
<td>30+30h</td>
<td>2q</td>
</tr>
<tr>
<td>LGCIV2031</td>
<td>Reinforced concrete structures</td>
<td>37.5+22.5h</td>
<td>1q</td>
</tr>
<tr>
<td>LGCIV1051</td>
<td>Hydraulic</td>
<td>30+30h</td>
<td>2q</td>
</tr>
</tbody>
</table>
### Majeure en électricité [ FSA1BA-LMAJ103J ]

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LELEC1101</td>
<td>Project in Electricity 1 : Electrical circuits</td>
<td>Christophe Craeye</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bruno Dehez</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Claude Oestges (coord.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LELEC1370</td>
<td>Measurements and electrical circuits</td>
<td>Christophe Craeye</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bruno Dehez</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Claude Oestges (coord.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LELEC1530</td>
<td>Basic analog and digital electronic circuits</td>
<td>Denis Flandre</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jean-Didier</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Legat (coord.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LELEC1755</td>
<td>ELECTRICITY : ADVANCED TOPICS</td>
<td>Denis Flandre</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Danielle Janvier</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Claude Oestges (coord.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LELEC1310</td>
<td>ELECTROMECHANICAL CONVERTERS</td>
<td>Bruno Dehez</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LELEC1360</td>
<td>TELECOMMUNICATIONS</td>
<td>Luc Vandendorpe</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>
# Majeure en informatique [ FSA1BA-LMAJ104J ]

<table>
<thead>
<tr>
<th>Code</th>
<th>Titre</th>
<th>Type</th>
<th>Heures</th>
<th>Credits</th>
<th>Année</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINFO1104</td>
<td>Paradigmes de programmation et concurrence</td>
<td>C</td>
<td>30+30h</td>
<td>5</td>
<td>1q, x</td>
</tr>
<tr>
<td>LINFO1225</td>
<td>Conception orientée objet et gestion de données</td>
<td>C</td>
<td>30+30h</td>
<td>5</td>
<td>2q, x</td>
</tr>
<tr>
<td>LINFO1252</td>
<td>Systèmes informatiques</td>
<td>C</td>
<td>30+30h</td>
<td>5</td>
<td>1q, x</td>
</tr>
<tr>
<td>LINFO1121</td>
<td>Algorithmique et structures de données</td>
<td>C</td>
<td>30+30h</td>
<td>5</td>
<td>1q, x</td>
</tr>
<tr>
<td>LINFO1341</td>
<td>Réseaux informatiques</td>
<td>C</td>
<td>30+30h</td>
<td>5</td>
<td>2q, x</td>
</tr>
<tr>
<td>LINFO1123</td>
<td>Calculabilité, logique et complexité</td>
<td>C</td>
<td>30+30h</td>
<td>5</td>
<td>2q, x</td>
</tr>
</tbody>
</table>
Majeure en mathématiques appliquées [ FSA1BA-LMAJ105J ]

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINMA1702</td>
<td>Optimization models and methods I</td>
<td>François Glineur</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LINMA1170</td>
<td>Numerical analysis</td>
<td>Jean-François Remacle</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LINMA1691</td>
<td>Discrete mathematics - Graph theory and algorithms</td>
<td>Vincent Blondel, Jean-Charles Delvenne</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LINMA1510</td>
<td>Linear Control</td>
<td>Denis Dochain</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LINMA1731</td>
<td>Stochastic processes : Estimation and prediction</td>
<td>Pierre-Antoine Absil, Luc Vandendorpe (coord.)</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>
### Majeure en mécanique [ FSA1BA-LMAJ106J ]

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
<th>Year</th>
<th>Teacher(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMECA1210</td>
<td>Description et analyse des mécanismes</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>LMECA1901</td>
<td>Continuum mechanics.</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LMECA1100</td>
<td>Deformable solid mechanics.</td>
<td>5</td>
<td>2</td>
<td>Issam Doghri</td>
</tr>
<tr>
<td>LMECA1855</td>
<td>Thermodynamics and energetics.</td>
<td>5</td>
<td>3</td>
<td>Yann Bartosiewicz, Miltiadis Papalexandris</td>
</tr>
<tr>
<td>LMECA1451</td>
<td>Mechanical manufacturing.</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>LMECA1321</td>
<td>Fluid mechanics and transfer phenomena</td>
<td>5</td>
<td>2</td>
<td>Vincent Legat, Grégoire Winckelmans</td>
</tr>
</tbody>
</table>
List of available minors

The student can choose to replace one of his·her specialization tracks by a non-polytechnic opening minor. The list of accessible minors is below. The choice has to be made before the beginning of the second annual unit.

- Majeure en génie biomédical
- Majeure en chimie et physique appliquées
- Majeure en construction
- Majeure en électricité
- Majeure en informatique
- Majeure en mathématiques appliquées
- Majeure en mécanique
- Mineure en droit (accès)
- Mineure en droit (ouverture)
- Minor in Economics
- Minor in Culture and Creation
- Minor in Development and Environment
- Minor in Engineering Sciences: Applied Chemistry and Physics
- Minor in Engineering Sciences: biomedical
- Minor in Engineering Sciences: Applied Mathematics
- Minor in Engineering Sciences: Computer Sciences
- Minor in Engineering Sciences: Construction
- Minor in Engineering Sciences: Electricity
- Minor in Engineering Sciences: Mechanics
- Minor in European Studies
- Minor in Gender Studies
- Minor in Geography
- Minor in Human and Social Sciences
- Minor in Information and Communication
- Minor in Literary Studies
- Minor in Management (basic knowledge)
- Minor in Mathematics
- Minor in Musicology
- Minor in Philosophy
- Minor in Physics
- Minor in Scientific Culture
- Minor in Statistics and data sciences
- Minor in Sustainable Development
- Minor in Urban Architecture
- Minor in entrepreneurship

(*) This program is the subject of access criteria
Course prerequisites

A document entitled en-prerequis-2018-fsa1ba.pdf specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

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

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.

In addition, when the panel validates a student’s individual programme at the beginning of the year, it ensures the consistency of the individual programme:
- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult regulation of studies and exams.

The programme's courses and learning outcomes

For each UCL training programme, a reference framework of learning outcomes specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document “In which teaching units are the competences and learning outcomes in the programme’s reference framework developed and mastered by the student?”

The document is available by clicking this link after being authenticated with UCL account.

Programme type

**FSA1BA - 1ST ANNUAL UNIT**

<table>
<thead>
<tr>
<th>O Mandatory</th>
<th>☒ Optional</th>
<th>☑ Periodic courses not taught during 2018-2019</th>
</tr>
</thead>
</table>

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

O Obligatory Courses

- **General Courses**
  - All the students attend all these courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1101</td>
<td>Algebra</td>
<td>30h+30h</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1102</td>
<td>Analyse I</td>
<td>30h+30h</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1201</td>
<td>Physique I</td>
<td>30h+30h</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1501</td>
<td>Projet 1</td>
<td>30h+30h</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1401</td>
<td>Informatique 1</td>
<td>30h+30h</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1104</td>
<td>Méthodes numériques</td>
<td>30h+30h</td>
<td>5</td>
<td>2q</td>
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<tr>
<td>LEPL1105</td>
<td>Analyse II</td>
<td>30h+30h</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1202</td>
<td>Physique II</td>
<td>30h+30h</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1502</td>
<td>Projet 2</td>
<td>30h+30h</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1301</td>
<td>Chimie et chimie physique 1</td>
<td>30h+30h</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>

- **Non-disciplinary Courses**
  - Cours obligatoires
  - Les étudiants suivent tous ces deux cours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Credits</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1801</td>
<td>Ethique de l'ingénieur</td>
<td>22.5h+15h</td>
<td>3</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1803</td>
<td>Economie</td>
<td>30h+30h</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>

- **Language Courses**
**English courses**
A placement test is organized at the beginning of the annual unit. Depending on the obtained mark, the students follow an adapted course based on their competence level. 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).

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Impetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANGL1171</td>
<td>Anglais pour ingénieurs civils I</td>
<td>2</td>
<td>1q</td>
</tr>
<tr>
<td>LNEER1300</td>
<td>General and academic Dutch - intermediate level</td>
<td>2</td>
<td>1q</td>
</tr>
<tr>
<td>LALLE1100</td>
<td>German - Elementary level</td>
<td>2</td>
<td>1 + 2q</td>
</tr>
<tr>
<td>LESPA1100</td>
<td>Spanish (beginner's level) 0-A2</td>
<td>2</td>
<td>1 + 2q</td>
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</tbody>
</table>

**Dutch courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Impetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNEER1300</td>
<td>General and academic Dutch - intermediate level</td>
<td>2</td>
<td>1q</td>
</tr>
</tbody>
</table>

**German courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Impetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>LALLE1100</td>
<td>German - Elementary level</td>
<td>2</td>
<td>1 + 2q</td>
</tr>
</tbody>
</table>

**Spanish Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Impetus</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESPA1100</td>
<td>Spanish (beginner's level) 0-A2</td>
<td>2</td>
<td>1 + 2q</td>
</tr>
</tbody>
</table>
FSA1BA - 2ND ANNUAL UNIT

○ Mandatory
△ Courses not taught during 2018-2019

○ Optional
○ Periodic courses not taught during 2018-2019
○ Periodic courses taught during 2018-2019

Activity with requisites

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

○ Obligatory Courses

○ General Courses
All the students attend all these courses.

- LEPL1103 EDPS et analyse complexe [C] 30h+30h 5 Credits 1q △
- LEPL1106 Signaux et systèmes [C] 30h+30h 5 Credits 2q △
- LEPL1203 Physique III [C] 30h+30h 5 Credits 1q △
- LEPL1108 Mathématiques discrètes et probabilité [C] 30h+30h 5 Credits 1q △
- LEPL1503 Projet 3 [C] 30h+30h 5 Credits 2q △
- LEPL1302 Chimie et chimie physique 2 [C] 30h+30h 5 Credits 1q △
- LEPL1402 Informatique 2 [C] 30h+30h 5 Credits 1q △

○ Language Courses

○ English courses
A placement test is organized at the beginning of the annual unit. Depending on the obtained mark, the students follow an adapted course based on their competence level. 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).

- LANGL1272 Anglais pour ingénieurs civils II [C] 30h 3 Credits 1q △

○ Dutch courses

- LNEER1500 Interfaculty teaching unit - General and academic Dutch - upper-intermediate level Valérie Dachy (coord.) 30h 2 Credits 1q

○ German courses

- LALLE1300 General German - Upper-intermediate Virginie Godin 90h 2 Credits 1 + 2q

○ Spanish Courses

- LESPA1300 Spanish middle level Carmen Vallejo Villamor 90h 2 Credits 1 + 2q

○ Religion courses for students in exact sciences
The students choose one course between:

- LTECO2100 Spirituality, culture, society - Biblical readings [M] Hans Ausloos 15h 2 Credits 1q
- LTECO2200 Spirituality, culture, society - reflections about Christian faith [M] Dominique Martens 15h 2 Credits 2q
- LTECO2300 Spirituality, culture, society: questions about ethics [M] 15h 2 Credits 1q

○ Specialization tracks
The students choose two specialization tracks (or one specialization track and one opening minor) between
De 30 à 60 credits parmi

○ Applied Chemistry and Physics

- LMECA1901 Continuum mechanics. 30h+30h 5 Credits 1q
- LMAPR1805 Introduction to materials science Jean-Christophe Charlier Pascal Jacques Aurélien Lherrier (compensates Jean-Christophe Charlier) Bernard Nysten Thomas Pardoen (coord.) 45h+15h 5 Credits 2q

○ Construction

- LGCIV1031 STRUCTURAL MATERIALS AND GEOMATERIALS 30h+30h 5 Credits 2q
- LGCIV1022 Mechanics of structures 30h+30h 5 Credits 2q

○ Electricity
### Biomedical Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Teacher(s)</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGBIO1111</td>
<td>Biologie et physiologie cellulaire</td>
<td>Charles De Smet, Christophe De Vleeschouwer, Pascal Kienlen-Campard</td>
<td>30h+15h</td>
<td>5 Credits</td>
</tr>
<tr>
<td>LGBIO1112</td>
<td>Introduction to biomedical engineering</td>
<td>Philippe Lefèvre</td>
<td>45h</td>
<td>5 Credits</td>
</tr>
</tbody>
</table>

### Computer Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINFO1104</td>
<td>Paradigmes de programmation et concurrence [C]</td>
<td>30h+30h</td>
<td>1q △</td>
</tr>
<tr>
<td>LINFO1225</td>
<td>Conception orientée objet et gestion de données [C]</td>
<td>30h+30h</td>
<td>2q △</td>
</tr>
</tbody>
</table>

### Applied Mathematics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINMA1315</td>
<td>Mathematical analysis : complements</td>
<td>30h+22.5h</td>
<td>2q</td>
</tr>
<tr>
<td>LINMA1702</td>
<td>Optimization models and methods I</td>
<td>30h+22.5h</td>
<td>2q</td>
</tr>
</tbody>
</table>

### Mechanics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMECA1210</td>
<td>Description et analyse des mécanismes</td>
<td>30h+30h</td>
<td>2q</td>
</tr>
<tr>
<td>LMECA1901</td>
<td>Continuum mechanics.</td>
<td>30h+30h</td>
<td>1q</td>
</tr>
</tbody>
</table>
### FSA1BA - 3RD ANNUAL UNIT

#### Obligatory Courses

**General Courses**
*All the students attend all these courses.*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1109</td>
<td>Statistiques et sciences des données</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1110</td>
<td>Eléments finis</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>

**Non-disciplinary Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1804</td>
<td>Développement durable et transition</td>
<td>3</td>
<td>1q</td>
</tr>
<tr>
<td>LEPL1805</td>
<td>Gestion des personnes</td>
<td>3</td>
<td>1q</td>
</tr>
</tbody>
</table>

**3rd annual unit project**
*The students choose a project (corresponding to one of their specialization tracks) between:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL1504</td>
<td>Projet 4 (en mécanique)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1505</td>
<td>Projet 4 (en chimie et physique)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1506</td>
<td>Projet 4 (en génie biomédical)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1507</td>
<td>Projet 4 (en mathématiques appliquées)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1508</td>
<td>Projet 4 (en électricité)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1509</td>
<td>Projet 4 (en informatique)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LEPL1510</td>
<td>Projet 4 (en construction)</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>

**Language Courses**

**English courses**
*A placement test is organized at the beginning of the annual unit. Depending on the obtained mark, the students follow an adapted course based on their competence level. 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).*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANG1373</td>
<td>Anglais pour ingénieurs civils III</td>
<td>2</td>
<td>1q</td>
</tr>
</tbody>
</table>

**Dutch courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNEER2500</td>
<td>Seminar of Entry to professional life in Dutch - Intermediate level</td>
<td>2</td>
<td>1 ou 2q</td>
</tr>
</tbody>
</table>

**German courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LALLE1500</td>
<td>General German - Advanced</td>
<td>2</td>
<td>1 +</td>
</tr>
</tbody>
</table>

**Spanish Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESPA1500</td>
<td>Spanish Advanced level (B1.2 , B2.1)</td>
<td>2</td>
<td>1q</td>
</tr>
<tr>
<td>LESPA1101</td>
<td>Spanish beginner's level 1st part (0-A1)</td>
<td>2</td>
<td>1 ou 2q</td>
</tr>
</tbody>
</table>

**Specialization tracks**
*The students choose two specialization tracks (or one specialization track and one opening minor) between De 30 à 60 credits parmi*

<table>
<thead>
<tr>
<th>Specialization Tracks</th>
<th>Credits</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Chemistry and Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Course</td>
<td>Lecturers</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LMAPR1491</td>
<td>Statistical &amp; quantum physics</td>
<td>Jean-Christophe Charlier, Xavier Gonze (coord.), Aurélien Lherbier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(compensates Jean-Christophe Charlier)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Luc Piraux, Gian-Marco Rignanese</td>
</tr>
<tr>
<td>LMAPR1230</td>
<td>Organic chemistry (M)</td>
<td>Sophie Demoustier, Benjamin Elias</td>
</tr>
<tr>
<td>LMAPR1400</td>
<td>Cinétique thermodynamique (M)</td>
<td>Christian Bailly, Juray De Wilde (coord.)</td>
</tr>
<tr>
<td>LMAPR1492</td>
<td>Materials physics</td>
<td>Jean-Christophe Charlier, Xavier Gonze (coord.), Aurélien Lherbier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(compensates Jean-Christophe Charlier)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Luc Piraux, Gian-Marco Rignanese</td>
</tr>
</tbody>
</table>

### Construction

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGCIV1023</td>
<td>Construction stability (M)</td>
<td>Benoît Pardoen</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LGCIV1072</td>
<td>Soil mechanics</td>
<td>Sandra Soares Frazao</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LGCIV1051</td>
<td>Hydraulic</td>
<td>Sandra Soares Frazao</td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
</table>

### Electricity

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LELEC1530</td>
<td>Basic analog and digital electronic</td>
<td>Denis Flandre, Jean-Didier Legat (coord.)</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td></td>
<td>circuits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LELEC1755</td>
<td>ELECTRICITY: ADVANCED TOPICS</td>
<td>Denis Flandre, Danielle Janvier, Claude Oestges</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LELEC1310</td>
<td>ELECTROMECHANICAL CONVERTERS</td>
<td>Bruno Dehez</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LELEC1360</td>
<td>TELECOMMUNICATIONS</td>
<td>Luc Vandendorpe</td>
<td>5</td>
<td>2q</td>
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</tbody>
</table>

### Biomedical Engineering

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGBIO1113</td>
<td>Anatomie et physiologie des systèmes</td>
<td>Catherine Behets, Wydemans, Olivier Comu</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LIEPR1024</td>
<td>Fundamentals of neurophysiology and</td>
<td>Julie Duque, Marcus Missal (coord.)</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td></td>
<td>neuropsychology in motor control and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>motor learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBIR1250A</td>
<td>Biochimie I (partim EPL)</td>
<td></td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LGBIO1114</td>
<td>Artificial organs and rehabilitation</td>
<td></td>
<td>5</td>
<td>2q</td>
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</tbody>
</table>

### Computer Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINFO1252</td>
<td>Systèmes informatiques [C]</td>
<td></td>
<td>5</td>
<td>1q</td>
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<tr>
<td>LINFO1121</td>
<td>Algorithmique et structures de données [C]</td>
<td></td>
<td>5</td>
<td>1q</td>
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<tr>
<td>LINFO1341</td>
<td>Réseaux informatiques [C]</td>
<td></td>
<td>5</td>
<td>2q</td>
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<tr>
<td>LINFO1123</td>
<td>Calculabilité, logique et complexité [C]</td>
<td></td>
<td>5</td>
<td>2q</td>
</tr>
</tbody>
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### Applied Mathematics

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINMA1170</td>
<td>Numerical analysis</td>
<td>Jean-François Remacle</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>LINMA1691</td>
<td>Discrete mathematics - Graph theory</td>
<td>Vincent Blondel, Jean-Charles Delvenne</td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td></td>
<td>and algorithms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LINMA1510</td>
<td>Linear Control</td>
<td>Denis Dochain</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LINMA1731</td>
<td>Stochastic processes - Estimation and</td>
<td>Pierre-Antoine Absil, Luc Vandendorpe (coord.)</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td></td>
<td>prediction</td>
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### Mechanics

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMECA1100</td>
<td>Deformable solid mechanics</td>
<td>Issam Doghri</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LMECA1321</td>
<td>Fluid mechanics and transfer phenomena.</td>
<td>Vincent Legat, Grégoire Winckelmans</td>
<td>5</td>
<td>2q</td>
</tr>
<tr>
<td>LMECA1451</td>
<td>Mechanical manufacturing</td>
<td></td>
<td>5</td>
<td>1q</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Lecturer(s)</td>
<td>Credits</td>
<td>Semester</td>
</tr>
<tr>
<td>------------</td>
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<td>----------</td>
</tr>
<tr>
<td>LMECA1855</td>
<td>Thermodynamics and energetics.</td>
<td>Yann Bartosiewicz, Miltiadis Papalexandris</td>
<td>5</td>
<td>1q</td>
</tr>
</tbody>
</table>
Information

Admission

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

> General requirements
> Specific requirements
> Knowledge of the French language exam
> Special requirements

General 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 (this qualification does not grant exemption from the French language proficiency examination), 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 no later than 14 July 2018 to the Equivalence department (Service des équivalences) of the Ministry of Higher Education and Scientific Research of the French Community of Belgium.
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.
These two qualifications do not, however, provide automatic exemption from the French language proficiency examination.
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 requirements

Admission to undergraduate studies on the basis of accreditation of knowledge and skills obtained through professional or personal experience (Accreditation of Prior Experience)

Subject to the general requirements laid down by the authorities of the higher education institution, with the aim of admission to the undergraduate programme, the examination boards accredit the knowledge and skills that students have obtained through their personal or professional experience.

This experience must correspond to at least five years of documented activity, with years spent in higher education being partially taken into account: 60 credits are deemed equivalent to one year of experience, with a maximum of two years being counted. At the end of
an assessment procedure organized by the authorities of the higher education institution, the Examination Board will decide whether a student has sufficient skills and knowledge to successfully pursue undergraduate studies. After this assessment, the Examination Board will determine the additional courses and possible exemptions constituting the supplementary requirements for the student’s admission.

Exam of knowledge of the French language

Anyone not demonstrating sufficient French language proficiency will not be admitted to the first-year undergraduate examinations.

Special requirements

• Admission to undergraduate studies in engineering: civil engineering and architect
  Pass certificate for the special entrance examination for undergraduate studies in engineering: civil engineering and architect.
  Admission to these courses is always subject to students passing the special entrance examination. Contact the faculty office for the programme content and the examination arrangements.

• Admission to undergraduate studies in veterinary medicine
  Admission to undergraduate studies in veterinary medicine is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).

• Admission to undergraduate studies in physiotherapy and rehabilitation
  Admission to undergraduate studies in physiotherapy and rehabilitation is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).

• Admission to undergraduate studies in psychology and education: speech and language therapy
  Admission to undergraduate studies in psychology and education: speech and language therapy is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).

• Admission to undergraduate studies in medicine and dental science
  Admission to undergraduate studies in medicine and dental science is governed by the Decree of 16 June 2006 regulating the number of students in certain higher education undergraduate courses (non-residents).

Note: students wishing to enrol for a Bachelor's degree in Medicine or a Bachelor's degree in dental science must first sit an aptitude test (fr).
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 (apprentissages par problèmes et par projets), des séances d'exercices, des travaux individuels et de groupe.

Ces dispositifs placent les étudiant·e·s au centre de leurs apprentissages et visent à leur faire acquérir l'ensemble des compétences, des attitudes généraiques (c'est-à-dire transversales aux champs disciplinaires) nécessaires pour mener à bien les études d'ingénieur civil et pour entreprendre une carrière professionnelle. Cette méthodologie est définie en cohérence avec les acquis d'apprentissage visés du programme de bachelier.

Les activités proposées au sein des enseignements permettent aux étudiant·e·s de découvrir ou d'exploiter des notions connues mais retravaillées dans un contexte neuf, d'engranger des acquis méthodologiques allant de pair avec un travail d'intégration, d'approfondissement et d'enrichissement des connaissances. Les étudiant·e·s sont initié·e·s au travail coopératif en groupe, à la gestion de leurs apprentissages, à la communication orale et écrite,...

Semaine de lancement S0 (P0)

Pour aborder les objectifs de formation méthodologique dès le début des études, la première semaine du premier bloc annuel du programme de bachelier est une semaine de lancement dénommée P0 présentant une organisation particulière. Les objectifs poursuivis durant cette semaine sont :

- Accueil des étudiant-e-s dans la Faculté ;
- Découverte de l'environnement universitaire et facultaire du site de Louvain-la-Neuve ;
- Initiation méthodologique à certains aspects du travail en équipe, de l'apprentissage par problèmes et par projets (APP).

Apprentissage par projets

Les projets du programme de bachelier visent à intégrer différentes matières du quadrimestre dans une même réalisation. Il ne s'agit donc pas de projets d'application des connaissances acquises précédemment, mais de projets d'apprentissage en interaction permanente avec les disciplines enseignées en parallèle suivant le modèle ci-après :

Apprentissage par problèmes

Au sein des différentes disciplines, des projets motivantes, actuels et interpellants sont proposées aux étudiant-e-s qui ne possèdent cependant pas toujours les compétences nécessaires pour y répondre. Ils nécessitent et amènent donc l'étudiant-e à travailler en groupe, à collaborer et à effectuer des recherches scientifiques, à planifier son travail et à s'organiser.

Ces deux types de situations problèmes coexistent et se complètent : le problème (disciplinaire et de courte durée) et le projet (plurisdisciplinaire et se déroulant sur un quadrimestre).

Evaluation

The evaluation methods comply with the regulations concerning studies and exams. More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading “Learning outcomes evaluation method”.

The course activities are evaluated in accordance with the prevailing rules of the University (c.f. exam regulations).

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.

Mobility and/or Internationalisation outlook

International Mobility

Mobility in the Faculty of Applied Sciences is equally a major attraction in the context of these studies. This usually takes place during the 4th or 5th year, i.e. during the master's studies. The students are therefore strongly encouraged to do everything possible to widen their communication skills and their knowledge of languages.

In fact, after being awarded the degree title " Bachelor in Engineering Sciences : Engineering " by UCL, the student will also have access to the existing master's (i.e. from the 4th and 5th years on) within the CLUSTER network - Consortium Linking Universities of Science and Technology for Education and Research, of which the Faculty is a member. Furthermore, UCL students benefit from the same access conditions as the bachelor students from these institutions. This European network groups together : UPC - Barcelona / TU-Darmstadt / TU-Eindhoven / INPG-Grenoble / Uni-Karlsruhe / EPFL-Lausanne / Imperial College London / KTH-Stockholm / Politecnico di Torino / UCL-FSA-Louvain-la-Neuve.

In the context of the master's studies in Engineering Sciences at UCL, the student is also entitled access to the ensemble of the Erasmus/Socrates exchange programmes which UCL has subscribed to together with universities from numerous European or extra-European countries, as well as the Catholic University of Leuven (KUL).

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 Sciences Engineering

Contacts

Curriculum Management

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Structure entity SST/EPL/BTCI
Denomination (BTCI)
Faculty Louvain School of Engineering (EPL)
Sector Sciences and Technology (SST)
Acronym BTCI
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Jury
• Président du Jury : Jean-Didier LEGAT
• Secrétaire du Jury : Paul FISETTE

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