Course Selection Guide

Exchange Students at École Polytechnique
International Academic Exchange Program
Academic Year 2022 - 2023

Greetings from l’École Polytechnique!

This guide is dedicated to students willing to join the International Academic Exchange Program and intends to help them understand their courses’ options and choose courses effectively at École Polytechnique.

Exchange students take courses with regular full-time students. They enroll in the International Academic Exchange Program (PEI) and receive ECTS credits for courses validated during their exchange period.

Exchange students enroll in one specific level of study (undergraduate or graduate) and chose their courses in that level of study.

We ask them to choose their courses in the same year of study (that is in the 2nd or 3rd year of the Bachelor program at undergraduate level; and in the 2nd or 3rd year of the Ingénieur Polytechnicien Program at graduate level).

Under specific conditions, exchange students may also attend courses from other levels if they meet all conditions for entry, including language and academic requirements and if the different courses schedules allow it.
1. Basic requirements

At undergraduate level, eligible students should have completed at least one year of their program of study in science or engineering.

At graduate level, eligible students should have completed at least three years of their program of study in science or engineering to have access to upper level courses (see below).

Exchange students must observe the same rules as regular students from our institution about registration for courses, attendance to courses, exams, use of computers, etc.

2. Enrollment process

Exchange students typically take 3 to 4 scientific courses per period. In some cases, an extra 5th course may be added. We expect exchange students to register for a minimum of 20 ECTS credits per period and/or for 4 different courses.

Exchange students can also follow humanities, management, language courses and sport classes in their level of enrollment. These courses give ECTS credits.

3. Approval process

We organize the following approval process to guarantee that chosen courses meet the language and academic conditions and to let exchange students register to courses prior to arrival on campus.

Our team will tell you when to arrive. Please note that it is your responsibility to make the necessary arrangements to be on time and arrive before the beginning of your courses. Late arrivals are not allowed.

An Orientation day is organized before the beginning of your courses. It is strongly recommended that you attend.

NB: we try our best to guarantee your registration to courses but we ask you at the same time to be flexible when discussing your study plan with your home institution, as classes included in the course catalogue are mostly under numerus clausus and as timetables are subject to change.
Content

Overview of the Curriculum at l’X

Academic Calendar

You are interested in

- Courses within the Bachelor Program at l’X (at Undergraduate level)
- Courses within the Ingénieur polytechnicien Program (at Graduate level)

You would like to study

- Mathematics
- Applied Mathematics
- Physics
- Computer Science
- Economics
- Mechanics
- Energy
- Electrical Engineering
- Chemistry
- Biology
- Sciences for the Challenges of the Environment
- Spatial Science and Challenges
- Humanities and Social Sciences
- Innovation Management and Entrepreneurship
- Improve your language skills
- Sports

You would like to join us for

- Fall term or the whole year
- Spring term

Need for help?

Do you have any troubles in finding courses on Synapses?

Further Resources to help you prepare your stay

Please contact us at exchange-international@polytechnique.fr
Overview of the different Curriculum at l’X

Academic programs

Baccalaureate or equivalent degree

Bachelor of Ecole Polytechnique
  3 years

French preparatory classes or bachelor

Ingénieur Polytechnicien Program (Master’s level degree)
  3 years

Degree from Ecole Polytechnique
  1 year

Bachelor or Licence

Master

MSc&T

Master

Continuing education

PhD Track
  2+3 years

Executive Master
  14 months

Executive Education

Executive Education
Overview of the Bachelor Program’s Structure

Multidisciplinary scientific common core

Double major Mathematics & Computer science (2 years)

Double major Mathematics & Physics (2 years)

Double major Mathematics & Economics (2 years)

Overview of the different Curriculum at l’X

Common core
General scientific curriculum

Multidisciplinary scientific studies
Group Science Project Appliedlab work

In-depth program

Specialization

4th year

Civil service

Master’s in France or abroad

Engineering studies in France

Humanities and social science - languages - personal development and military training - sports

Internship in a company (3 months)

Research internship (5 months)

End of studies internship (4-6 months)
# Academic Calendar

## Undergraduate level (the Bachelor Program)

### 1st & 2nd years
- **1st & 3rd semester**
  - **Teaching**: September to January
  - **Examination**: End of January
- **2nd & 4th semester**
  - **Teaching**: February to June
  - **Examination**: End of June

### 3rd year
- **5th semester**
  - **Teaching**: September to December
  - **Examination**: Mid-December
- **6th semester**
  - **Teaching**: Mid-February to Mid-May
  - **Thesis**: April to June
  - **Examination**: End of June

## Graduate level (calendar for the Ingénieur polytechnicien Program)

### 2nd years
- **1st term**
  - **Teaching**: August to Mid-November
  - **Examination**: Mid-November
- **2nd term**
  - **Teaching**: Mid-November to Mid-February
  - **Examination**: End of February
- **3rd term**
  - **Teaching**: Mid-February to Mid-May
  - **Examination**: End of May

### 3rd year of Ingénieur Polytechnicien Program/1st year of MScT
- **1st term**
  - **Teaching**: September to December
  - **Examination**: Mid-December
- **2nd term**
  - **Teaching**: January to March
  - **Examination**: Mid-March
- **3rd term**
  - **Teaching**: April to August
  - **Research Internship**: End of April

## Breaks
- **Halloween**: End of October (1 week)
- **Christmas**: End of December – Early January (2 weeks)
- **Winter**: End of February (1 week)
- **Easter**: End of April (1 week)
You are interested in Undergraduate level courses

You can join our Bachelor Program. Courses are taught in English only and exams are to be taken in English as well. Your English proficiency must be high.

The first year of studies focuses on the acquisition of the fundamental skills and knowledge. For their second and third years, students choose between three double majors:

- Mathematics and Physics
- Mathematics and Computer Science
- Mathematics and Economics

For each double major, students have the opportunity to pursue a minor:

- Mathematics and Physics
- Mathematics and Computer Science
- Mathematics and Economics

- Minor in Biology or Chemistry
- Minor in Biology
- Minor in Computational Mathematics

Exchange students have access to the whole course catalog, minor included provided that they meet the academic pre-requisites.

As the course load may be quite dense, we ask you to choose your courses in the same Double Major and in the same year to avoid timetable conflicts.

Exchange students can carry out a Bachelor Thesis. Please note this opportunity is open to students staying the whole year and joining the 3rd year of the program only. Final registration is subject to academic approval. Exchange students must register for it at the beginning of their application.
You are interested in Graduate level courses

You can join the 2nd and 3rd years of our Ingénieur polytechnicien Program and ask to add up to 2 courses per period in the first year of a one of our Masters of Science and Technology (MSc&T).

**Ingénieur polytechnicien Program - Year 2**

Courses are taught in French only and exams are to be taken in French as well. Your French proficiency must be high.

Year 2 is divided into 3 periods and provides a multi-disciplinary scientific education.

**Exchange students are advised to choose 3 or 4 scientific courses per period.**

Exchange students can choose only one Applied Laboratory Module (MODAL) during their Exchange period. Please note that this project is subject to numerus clausus but do not hesitate to ask for it and we will help you to find the right project at the right time of the year.

You can ask to add one to a maximum of two courses from the 3rd year (3A) or from a Master of Science and Technology (MSc&T). Due to numerus clausus, it will be subject to academic approval to verify if you have the academic and linguistic prerequisites to follow courses in an upper level. Please note that calendars are not similar and exams may be set up the same day. In any case, exchange students are responsible for checking the compatibility of their schedules.

**Restriction:** Group Science Projects (PSC) are not open to exchange students.

**Ingénieur polytechnicien Program - Year 3**

Courses are taught in French and/or English depending on the subject.

Year 3 is divided into 3 terms: the first two terms consists in scientific courses and have a duration of 3 months each while the third term is dedicated to a scientific research internship (for a duration up to 6 months). The exchange student can join us for 1, 2 or 3 terms.

Courses are divided into scientific concentrations. Exchange students are asked to choose 4 courses per term only and in the same concentration track. 1 course can be chosen in another concentration track if the timetable allows it.

Please be aware that Practical lessons (EA) are subject to numerus clausus.

**Students can undertake a research internship in Spring term** if he or she stays the whole year and if the internship is completed at an École Polytechnique’s laboratory or in the Paris region. Please note that you cannot do a research internship and follow courses at the same time.

If you want to add one to two courses in the 2nd year (2A) or in a Master of Science and Technology (MSc&T), you can ask for it. Due to numerus clausus, it will be subject to academic approval. Please note that calendars are not similar and exams may be set up the same day.

**Restriction:**

- Enrollment is limited to two courses maximum per period.
- The Master **Data Science for Business Program is not open to exchange students.**
- Exchange students cannot enroll in courses taught as part of the **2nd year of a Master of Science and Technology.**

**Master of Science and Technology (MSc&T)**

Courses in the Masters of Science and Technology are exclusively taught in English.

Provided that they have completed at least 3 years of undergraduate study, exchange students can ask to enroll in one to two courses taught as part of the first year of a Master of Science and Technology. Please note that due to numerus clausus, final enrollment is subject to academic approval.

**Restriction:**

- Enrollment is limited to two courses maximum per period.
- The Master **Data Science for Business Program is not open to exchange students.**
- Exchange students cannot enroll in courses taught as part of the **2nd year of a Master of Science and Technology.**
You would like to study Mathematics - Physics – Computer Science – Economics

A wide range of courses in Mathematics, Physics, Computer Science and Economics are available within the Bachelor and the Ingénieur Polytechnicien programs.

Please note that you should have relevant academic knowledge for your chosen classes.

At undergraduate level

The Bachelor of Science is an intense program leading to a double major either in Mathematics & Physics, or in Mathematics & Computer Science or in Mathematics & Economics.

Mathematics at the Center of the Program: The Mathematics courses given in École Polytechnique's Bachelor Program are designed to fit any subsequent specialization streams (Physics, Economics, Computer Science).

We expect our students to have an excellent command in Mathematics and a strong interest in this field.

At graduate level

To find out more on the list of courses available in the 2nd year of the Ingénieur Polytechnicien Program
To find out more on the list of courses in the 3rd year of the Ingénieur polytechnicien Program

The brochures of each concentration track are available on the above link.

Should you want to join

- the Mathematic concentration track, please find further information here (in French)

  Please consult the description of each course on Moodle to know more about the academic prerequisites. Please note that all courses are taught in French.

- the Computer Science concentration track

  Please consult the brochure and we strongly advise you to choose your courses in only one specialization (courses mostly taught in English) Please consult the description of each course on Moodle here to know more about the academic prerequisites.

- the Physics concentration track, please find further information here (in French)

  Please consult the description of each course on Moodle to know more about the academic prerequisites. Please note that all courses are taught in French.

- the Economics concentration track, please consult the brochure.

  Courses are entirely taught in English.
  Candidates for the 3rd year of Ingénieur polytechnicien Program should have a strong command of Mathematics and quantitative methods to apply for this track.
  That means that candidates should have followed at least one course in Microeconomics (or in some cases even in Econometrics) and should have a background in Mathematics, Applied Mathematics, or even Computer Science or Theoretical Physics.
  Please refer to each course on the Moodle platform here to find out more on the academic prerequisites.
You would like to study Chemistry, Biology

Please note that you should have relevant academic knowledge for your chosen classes.

At undergraduate level

These minors consist in a few courses available to student enrolled either in the mathematics & physics double major or in the mathematics & computer science double major. Should you want to obtain more ECTS credits, we advise you to apply for an exchange at graduate level (if you meet the entry requirements).

At graduate level

To find out more on the list of courses available in the 2nd year of the Ingénieur Polytechnicien Program
To find out more on the list of courses in the 3rd year of the Ingénieur Polytechnicien Program

The brochures of each concentration track are available on the above link.

Should you want to join

- the Chemistry concentration track, please find further information here (in French)
- the Biology concentration track please consult the brochure.

Courses are entirely taught in English.
Please consult the description of each course on Moodle to know more about the academic prerequisites.

Courses are mostly taught in English.
Please consult the description of each course on Moodle to know more about the academic prerequisites.
You would like to study Applied Mathematics, Mechanics, Energy, Electrical Engineering, Spatial Science

Please note that you should have relevant academic knowledge for your chosen classes.

At undergraduate level

You can find some relevant courses in the above-mentioned fields but should you want to obtain more ECTS credits, we advise you to apply for an exchange at graduate level (if you meet the entry requirements).

At graduate level

To find out more on the list of courses available in the 2nd year of the Ingénieur Polytechnicien Program
To find out more on the list of courses in the 3rd year of the Ingénieur polytechnicien Program

The brochures of each concentration track are available on the above link.

Should you want to join

- **the Applied Mathematics concentration track, please find further information here (in French)**

  Please note that half of the courses are taught in English

- **the Electrical Engineering concentration track, please find further information here.**

  Please note that this track offers a multidisciplinary approach and gathers courses from the Physics Department, from the Computer Science Department and from the Applied Mathematics Department. The courses are entirely taught in English.

- **the Innovation Technology concentration track, please find further information here.**

  This track offers you to combine two high level specializations, the first one in science, and the second one in Management. You should meet the specific requirements for both specializations, especially in science. Courses are taught in French and in English.

- **the Spatial Science and Challenges concentration track, please find further information here.**

  This intrinsically multidisciplinary specialization offers courses from 4 different Departments:

  Physics, Mechanics, Applied Mathematics, Computer Science.

  Courses are taught in French and in English.

  Should you be interested in it, please consult us beforehand.
You would like to add courses in Humanities and Social Sciences

In addition to their education in fundamental sciences, École Polytechnique’s students follow several courses providing them with the complementary soft skills to round out their scientific background and knowledge. Through courses in humanities and social sciences, students discover artistic and literary masterpieces, learn about French and European political systems and discuss ethical questions related to sciences.

Courses in the department focused on these three main areas:
- Law, Economics and Political Science
- Literature and Humanities
- Arts and Architecture

Exchange students can ask to join one course and one seminar if in the Ingénieur polytechnicien Program with no required approval and no added fees.

There are 4 Personal Development courses (PDV) open at undergraduate level for exchange students. That are PDV at 300 level, Diversity Report and Active Volunteering. Humanities and French Culture courses taught in English in the MScT, if their timetables allow it and if spot are available (there are numerus clausus). The courses given in the MSc&T (taught in English) can be found here.

Please note that in the Ingénieur Polytechnicien Program, almost all Humanities and Social Sciences courses and seminars are taught in French. Your French proficiency must therefore be high (B2 level) to attend classes. As courses are subject to numerus clausus, we cannot guarantee that spots will be open.

The list of courses can be found here (Year 2 – Year 3) but the department of Humanities and Social Sciences may confirm in September of each year the list of courses open for exchange students. Courses are subject to numerus clausus and some are taught in French. Your French proficiency must therefore be high (B2 level) to attend these classes. For more information, please consult us.

Please note that in the 3rd year of the Ingénieur polytechnicien Program, students cannot follow at the same time the seminar in Humanities & Social Sciences and the seminar in Innovation Management and Entrepreneurship due to timetable conflict.

You would like to add courses in Innovation Management and Entrepreneurship

The Department of Innovation Management and Entrepreneurship offers basic and advanced courses to all students in innovation management and entrepreneurship.

Exchange students can ask to join one course if in the Bachelor program (in semester 6), one course and one seminar if in the Ingénieur polytechnicien Program with no required approval and no added fees.

Exchange student must take these courses in their chosen level of enrollment.

Bachelor students have one course in innovation management and entrepreneurship taught in English that exchange students may register for, in semester 6. To find out more, please consult the Year 3 syllabus on the Bachelor website.
Courses are subject to numerus clausus and some are taught in French. Your French proficiency must therefore be high (B2 level) to attend these classes. For more information, please consult us.

Students enrolled in the Ingénieur polytechnicien Program can ask to follow courses taught in English in the MScT, if their timetables allow it and if enough spots are available (there are numerus clausus and the list of courses is usually set up in late August or early September each year). The list of course for the MSc&T can be found here. For more information, please consult us.

Please note that in the 3rd year of the Ingénieur polytechnicien Program, students cannot follow at the same time the seminar in Management and Entrepreneurship and the seminar in Humanities & Social Sciences due to timetable conflict.

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You would like to improve your language skills

The Department of Languages and Cultures offers a large choice of language courses: Chinese, English, German, Italian, Japanese, Spanish, Arabic, Russian, Hebrew and French as a foreign language.

Exchange students can ask to join one course of French as a foreign language with no required approval and no added fees. You must take these courses in your chosen program of enrollment.

In each program, French courses are open to beginners (A1, A2 levels), to intermediate levels (B1, B2 levels) and thematic courses are also available for students with an advanced level (C1, C2 levels). To find out more, consult the list of French as a Foreign Language's courses.

A placement test is organized before the beginning of the courses to register you in the group that best suits to your level.

Exchange students can add one more course in another foreign language. If you would like to register to another foreign language course, please note that you should demonstrate a B1 level at least and approval will be subject to classroom availability. Please send us a proof of your level.

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You would like to do Sports on campus

Exchange students can also practice sports and benefit from the campus’ great sport facilities. You can register for sport courses upon your arrival on campus.

There are 2 main options: either to do sports with regular full-time students (2 to 6 hours a week), or to do sports at École Polytechnique’s sports center (called CSX) together with students and staff; the second option will require small fees.

We advise exchange students to do sports with regular full-time students of their chosen level of enrollment, as this is the best way to network with other students on campus.
You would like to join us for the fall semester or for the whole year

At graduate level, fall term offers a large choice of courses. Should you stay the whole year, you will have the possibility to undertake a research internship in one of École Polytechnique’s laboratory.

For undergraduate students willing to undertake a research project or a Bachelor thesis, please note that this opportunity is open only for students registered in the 3rd year of the Bachelor program and for students staying the whole year.

You would like to join us for the spring semester only

At undergraduate level, exchange students can join us in spring semester only to follow courses in semesters 2 or 4. Please note that courses in the semester 6 start in early April until end of June. Registration for the Bachelor thesis is only available to students enrolling for the whole year (see above).

Please note that at graduate level courses are only available from January to March (mostly in French in the 3rd year of the Ingénieur polytechnicien Program) and from January to June (in French only in the 2nd year of the Ingénieur polytechnicien Program). Therefore, students willing to join us at graduate level in Spring semester must demonstrate a B2/C1 level in French prior to their arrival. Candidates are asked to do a placement test in French prior to their arrival.

Registration for the research internship will not be open for students joining us for the spring semester. Should you want to undertake a research internship only, please apply for the Internship program for International Students (deadline: end of January for internship in spring or in the summer).
How to find a course on Synapses (École Polytechnique’s Courses catalog)

For Bachelor Program, please consult the syllabi available online for updated version.

In the top right corner, please select the flag (French or English).

Then select your chosen program of enrollment.

Please note that for Master of Science and Technology (formerly Graduate Degree) you can select your chosen master courses at this stage. For Ingénieur polytechnicien Program, please select the program first, then your year of enrollment and, if Year 3, your chosen Scientific Concentration track (called Programme d’Approfondissement or PA). For Bachelor Program, please consult only the syllabi available online.

For some Scientific Concentrations, you can choose the specialization in the “Program composition” section and then have access to the courses related to this specialization.
How do I know when the courses are taught?

By looking to the courses’ codes

Bachelor

For example, **CSE 301**: Advanced Programming in C++ taught in Year 3
The 3 first letters indicate the field of study while the 3 last digits indicate the year for that course.

<table>
<thead>
<tr>
<th>CSE</th>
<th>Computer Science</th>
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<tbody>
<tr>
<td>MAA</td>
<td>Mathematics</td>
</tr>
<tr>
<td>PHY</td>
<td>Physics</td>
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<tr>
<td>ECO</td>
<td>Economics</td>
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</tbody>
</table>

Bachelor

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<table>
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<th></th>
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<tbody>
<tr>
<td>100</td>
<td>1st year (semester 1 and semester 2)</td>
</tr>
<tr>
<td>200</td>
<td>2nd year (semester 1 and semester 2)</td>
</tr>
<tr>
<td>300</td>
<td>3rd year (semester 1 and semester 2)</td>
</tr>
</tbody>
</table>

Ingénieur polytechnicien Program

For example, **INF 550**: Advanced Algorithmics taught in Year 3
The 3 first letters indicate the name code of the department that taught it while the 3 last digits indicate the year and the semester for that course.

<table>
<thead>
<tr>
<th>AP</th>
<th>Public Affairs</th>
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<tbody>
<tr>
<td>BIO</td>
<td>Biology</td>
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<tr>
<td>CHI</td>
<td>Chemistry</td>
</tr>
<tr>
<td>ECO</td>
<td>Economics</td>
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<tr>
<td>EE</td>
<td>Electrical Engineering</td>
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<tr>
<td>ENR</td>
<td>Energies for the 21st Century</td>
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<tr>
<td>HSS</td>
<td>Humanities and Social Sciences</td>
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<tr>
<td>INF</td>
<td>Computer Science</td>
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<tr>
<td>IT</td>
<td>Technological Innovation</td>
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<tr>
<td>LAN</td>
<td>Languages and Culture</td>
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<tr>
<td>MAP</td>
<td>Applied Mathematics</td>
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<tr>
<td>MAT</td>
<td>Pure Mathematics</td>
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<tr>
<td>MIE</td>
<td>Innovation Management and Entrepreneurship</td>
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<tr>
<td>MEC</td>
<td>Mechanics</td>
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<tr>
<td>PHY</td>
<td>Physics</td>
</tr>
<tr>
<td>SDE</td>
<td>Science for Environmental Challenges</td>
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<tr>
<td>SDS</td>
<td>Science and Challenges of Space</td>
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</tbody>
</table>

For courses taught at graduate level, courses codes starting with 550 and 570 are generally taught in term 1 (Fall term), courses starting with 560 and 580 are generally taught in term 2 (Winter term) and codes starting with 590 refers to the research internship (Spring term).

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<tbody>
<tr>
<td>300</td>
<td>1st year</td>
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<td>400</td>
<td>2nd year</td>
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<tr>
<td>500</td>
<td>3rd year</td>
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Further Resources

Synapses

It’s an online platform with free access to our course catalog. Once registered at l’X you will receive an email with your login/password. Your timetable will be available there and you will have access to the courses materials and supports and to your grades.

MOOCs

To prepare your stay, you have the possibility to watch our online courses and videos here (some courses in English). For students with a B1 level in French, please have a look to this language course “Étudier en France: French Intermediate course B1-B2”.

Courses

Courses are broken down into lectures in amphitheater (approximately 100-200 students per course) and lessons in small groups (approximately 10-20 students per course).

Courses taught in English

At undergraduate and in the MScT, all courses are taught in English. In the Ingénieur polytechnicien Program, some courses in the 3rd year are taught in English: you can find them on SynapseS by looking for courses whose titles are in English.

Adding/deleting a course

Once registered to a course, we will give you a few days after your arrival to finalize your choice. Please note that you must first receive the approval of your home institution before adding or deleting a course.

Attendance to courses

Some courses have a limited number of participants. Due to classroom capacity, once a course is full we are unable to add more students and we do not use waiting list. If you enroll without going to the course, it means you are taking the place of another student. Attendance in all scheduled courses is mandatory and any absences must therefore be justified and documented. According to each program’s regulations, 3 unjustified absences in classes, labs, seminars, sports and language classes or tutorials will result in a maximum coursework grade of C (passing grade).

Having missed a lesson?

Please contact your academic coordinator or registration office. Should you anticipate some absences for personal or medical reasons, please give us a leave for absence as soon as possible.

Exam schedule

Detailed exam timetables will be released approximately one month before the exam. Exam timetables will be available on your student records page.