



ESME School of Engineering

# Undergraduate Program

Courses available for exchange students – Undergraduate Level

Paris	Lille	Lyon
		
Engineering Sciences Undergraduate program	Engineering Sciences Undergraduate program	Engineering Sciences Undergraduate program

Please note that all classes below are available in the 3 campuses



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Table des matières

Undergraduate Program – Creative Engineering Workshops – Fall Semester (September – January) .....	2
Undergraduate Program – Creative Engineering Workshops – Spring Semester (February - June) .....	3
Undergraduate Program – Year 1 – Fall Semester (September – January) .....	5
Undergraduate Program – Year 1 – Spring Semester (February – June) .....	6
Undergraduate Program – Year 2 – Fall Semester (September – January) .....	7
Undergraduate Program – Year 2 – Spring Semester (February – June) .....	8
Undergraduate Program – Year 3 – Fall Semester (September – January) .....	9
Undergraduate Program – Year 3 – Spring Semester (February – June) .....	10



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Undergraduate Program – Creative Engineering Workshops – Fall Semester (September – January)

SEMESTER	TEACHING UNIT	COURSE DESCRIPTION	AIMS	HOURS	ECTS CREDITS
1, 3	Alternative Controllers	Design, test and fabricate new ways to play your favourite games! Using standout projects of the AltCtrl movement for inspiration, student teams will learn and use a wide range of digital design and fabrication skills and tools, as well as electronic sensors, actuators and control systems. Their goal: make a completely new way to play an existing game, or even design and make their own! You will learn to think outside the box, break the box down, reassemble it, and connect it to control modules for an innovative play experience.	The final boss battle is a showcase, where other students and industry professionals come and play with your device. Players need to have fun with your prototype, and it needs to survive!	25 to 30 hrs	10
1, 2, 3, 4	Interactive Expérience Design	Design and make an interactive project, based around wireless IoT technology. This workshop is designed to be accessible to first-time makers. The only hard constraint for your project is ambition. Want to create a laser and sensor-based mini escape game? An interactive story machine? An automated drink mixer? It's up to you to choose your focus. Electronics, sensor arrays, digital design and/or fabrication, biodesign, among many others, of course. We help you assemble - and provide you with - a customised learning program to suit your team's needs.	We encourage the use of advanced electronics, such as Raspberry Pi , printed circuit board and wireless open source solutions to make remotely controlled devices. The final showcase will involve and external visitors to impress with the results of your creative engineering work!	25 to 30 hrs	10



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Undergraduate Program – Creative Engineering Workshops – Spring Semester (February - June)

SEMESTER	TEACHING UNIT	COURSE DESCRIPTION	AIMS	HOURS	ECTS CREDITS
2, 4	Design for Disability  (With the LPI – Learning Planet Institute)	ESME partners with the <a href="#">Learning Planet Institute</a> to offer this hands-on workshop in English. In groups, students try to create and / or improve everyday technological solutions in order to reach the sustainable development goals set by the UN, specifically those concerning health & disabilities.	Each group has a budget of 300€ to purchase items pertaining to the project they are working on. Students use 3D printers, laser cutters, Arduino boards and other tools to conceptualize, experiment and carry their projects out.	25 to 30 hrs	10
2, 4	Gears for Breakfast	Put your knowledge of mechanical motion into practice by designing and fabricating an original mobile assembly. Student teams will experiment with a variety of motion control and execution systems, and combine them into an original, never-before-seen complex mechanical creation. The wide range of possible project directions includes wearable mechanical masks, steampunk vehicles, automatic musical instruments, Rube Goldberg machines, soft robotics, and wind-driven robots, to name but a few. It's up to you to define how your kinetic creation will mix movement and blow our minds!	Student teams will put into practice and combine physics principles such as torque, force, kinetic energy, and motion conversion, with digital design and fabrication, and both powered (eg. electric motors) and unpowered (eg. hydraulics) drive and control systems.	25 to 30 hrs	10



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

1, 2, 3, 4	<p>Interactive Expérience Design</p>	<p>Design and make an interactive project, based around wireless IoT technology. This workshop is the culmination of the previous years', yet is still designed to be accessible to first-time makers. The only hard constraint for your project is ambition. Want to create a laser and sensor-based mini escape game? An interactive story machine? An automated drink mixer? It's up to you to choose your focus. Electronics, sensor arrays, digital design and/or fabrication, biodesign, among many others, of course. We help you assemble - and provide you with - a customised learning program to suit your team's needs.</p>	<p>We encourage the use of more advanced electronics, such as Raspberry Pi and wireless open source solutions to make devices that can be controlled remotely. You'll even have the opportunity to design and make your own printed circuit board. As with the other workshops, the final showcase will involve other students and external visitors to impress with the results of your creative engineering work!</p>	25 to 30 hrs	10
------------	--	---	---	-----------------	----



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Undergraduate Program – Year 1 – Fall Semester (September – January)

SEMESTER	TEACHING UNIT	COURSE	HOURS	ECTS CREDITS
1	UE 1 - Fund. Sciences for Engineers	Fundamental Math	27 hrs	6
1	UE 1 - Fund. Sciences for Engineers	Applied Math	27 hrs	6
1	UE 1 - Fund. Sciences for Engineers	Electrokinetics	47 hrs	10
1	UE 2 - Sciences for Energy & Climate	Technical Systems	26 hrs	5
1	UE 2 - Sciences for Energy & Climate	Wave Motion et Geometrical Optics	30 hrs	6
1	UE 2 - Sciences for Energy & Climate	Living Systems	12 hrs	2
1	UE 2 - Sciences for Energy & Climate	Citizens & Sciences	10,5 hrs	2
1	UE 3: Languages & Tech for Engineers	Python Language	18 hrs	3
1	UE 3: Languages & Tech for Engineers	French as a Foreign Language	10,5 hrs	2
1	UE 3: Languages & Tech for Engineers	English Language	27 hrs	5
1	UE 3: Languages & Tech for Engineers	Additional Language	18 hrs	3
1	UE 4: Perso. & Pro. Projects	Introduction to Business Economics	15 hrs	3



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Undergraduate Program – Year 1 – Spring Semester (February – June)

SEMESTER	TEACHING UNIT	COURSE	HOURS	ECTS CREDITS
2	UE 1 - Fund. Sciences for Engineers	Fundamental Math	39 hrs	8
2	UE 1 - Fund. Sciences for Engineers	Applied Math	39 hrs	8
2	UE 1 - Fund. Sciences for Engineers	Electromagnetism	39 hrs	8
2	UE 2 - Sciences for Energy & Climate	Technical Systems	26 hrs	5
2	UE 2 - Sciences for Energy & Climate	Thermal Machines & Thermal Transfers	36 hrs	6
2	UE 2 - Sciences for Energy & Climate	Living Systems	12 hrs	2
2	UE 2 - Sciences for Energy & Climate	Citizens & Sciences	10,5 hrs	2
2	UE 2 - Sciences for Energy & Climate	Microcontroller Programming	12 hrs	2
2	UE 3: Languages & Tech for Engineers	Advanced Algorithmics	24 hrs	5
2	UE 3: Languages & Tech for Engineers	English Language	45 hrs	10
2	UE 3: Languages & Tech for Engineers	Additional Language / French Language	20 hrs	4
2	UE 3: Languages & Tech for Engineers	Introduction to Business Economics 1	15 hrs	3
2	UE 4: Perso. & Pro. Projects	Introduction to Business Economics 2	21 hrs	4



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Undergraduate Program – Year 2 – Fall Semester (September – January)

SEMESTER	TEACHING UNIT	COURSE	HOURS	ECTS CREDITS
3	UE 1 - Fund. Sciences for Engineers	Fundamental Math	39 hrs	8
3	UE 1 - Fund. Sciences for Engineers	Applied Math	39 hrs	8
3	UE 1 - Fund. Sciences for Engineers	Introduction to Digital Analysis	24 hrs	5
3	UE 1 - Fund. Sciences for Engineers	Signals & Systems	47 hrs	10
3	UE 2 - Sciences for Energy & Climate	Technical Systems	26 hrs	5
3	UE 2 - Sciences for Energy & Climate	Fluid Mechanics et acoustic waves	36 hrs	7
3	UE 2 - Sciences for Energy & Climate	Living Systems	12 hrs	2
3	UE 2 - Sciences for Energy & Climate	Project Management: SMART Objectives	10,5 hrs	2
3	UE 3: Languages & Tech for Engineers	Analog Electronics	24 hrs	5
3	UE 3: Languages & Tech for Engineers	English Language	18 hrs	3
3	UE 3: Languages & Tech for Engineers	Additional Language	20 hrs	4
3	UE 4: Perso. & Pro. Projects	Personal Development	10,5 hrs	2
3	UE 4: Perso. & Pro. Projects	Business Strategy	18 hrs	3





ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

## Undergraduate Program – Year 2 – Spring Semester (February – June)

SEMESTER	TEACHING UNIT	COURSE	HOURS	ECTS CREDITS
4	UE 1 - Fund. Sciences for Engineers	Fundamental Math	36 hrs	7
4	UE 1 - Fund. Sciences for Engineers	Applied Math	36 hrs	7
4	UE 1 - Fund. Sciences for Engineers	Electromagnetism	36 hrs	7
4	UE 2 - Sciences for Energy & Climate	Technical Systems	26 hrs	5
4	UE 2 - Sciences for Energy & Climate	Electromagnetic Waves	25.5 hrs	5
4	UE 2 - Sciences for Energy & Climate	Living Systems	12 hrs	2
4	UE 2 - Sciences for Energy & Climate	HMI Applications	10 hrs	2
4	UE 3: Languages & Tech for Engineers	Analog Electronics	24 hrs	5
4	UE 3: Languages & Tech for Engineers	Advanced Algorithmics	24 hrs	5
4	UE 3: Languages & Tech for Engineers	English Language	63 hrs	10
4	UE 3: Languages & Tech for Engineers	Additional Language	20 hrs	4
4	UE 4: Perso. & Pro. Projects	Personal Development	10,5 hrs	2
4	UE 4: Perso. & Pro. Projects	Business Strategy	18 hrs	3



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

**IF YOU CHOOSE TO COME TO PARIS, PLEASE NOTE THAT OUR 3<sup>rd</sup> YEAR CLASSES ARE ONLY AVAILABLE ON OUR SOUTH PARIS CAMPUS**

If you choose Lyon or Lille, these classes will be available on the same campus.

### Undergraduate Program – Year 3 – Fall Semester (September – January)

SEMESTER	TEACHING UNIT	COURSE	HOURS	ECTS CREDITS
5	UE 1 – Mathematic and Numeric Tools	Statistics and Probabilities	24 hrs	5
5	UE 1 – Mathematic and Numeric Tools	Signal Processing	48 hrs	10
5	UE 1 – Mathematic and Numeric Tools	Linear Systems	28 hrs	5
5	UE 1 – Mathematic and Numeric Tools	Java	36 hrs	7
5	UE 2 – Material Environment	Energy	32 hrs	6
5	UE 2 – Material Environment	Electronics	46 hrs	10
5	UE 2 – Material Environment	UNIX	24 hrs	5
5	UE 2 – Material Environment	Software Engineering	24 hrs	5
5	UE 3: Soft Skills	Project Dynamics	24 hrs	5
5	UE 3: Soft Skills	Business Models	22 hrs	5
5	UE 3: Soft Skills	English Language	48 hrs	10
5	UE 3: Soft Skills	Additional Language	12 hrs	2



ESME School of engineering

Paris-Center Campus

Courses available for exchange students – Undergraduate Level

**IF YOU CHOOSE TO COME TO PARIS, PLEASE NOTE THAT  
OUR 3<sup>rd</sup> YEAR CLASSES ARE ONLY AVAILABLE ON OUR  
SOUTH PARIS CAMPUS**

If you choose Lyon or Lille, these classes will be available  
on the same campus.

## Undergraduate Program – Year 3 – Spring Semester (February – June)

SEMESTER	TEACHING UNIT	COURSE	HOURS	ECTS CREDITS
6	UE 1 – Mathematic and Numeric Tools	Optimization	24 hrs	5
6	UE 1 – Mathematic and Numeric Tools	Statistical Signal Processing	32 hrs	6
6	UE 1 – Mathematic and Numeric Tools	Machine Learning	24 hrs	5
6	UE 1 – Mathematic and Numeric Tools	Linear Automatic	28 hrs	6
6	UE 1 – Mathematic and Numeric Tools	Web programing	24 hrs	5
6	UE 2 – Material Environment	Electric Machines	32 hrs	6
6	UE 2 – Material Environment	Microsystems	28 hrs	6
6	UE 2 – Material Environment	Network Overview	24 hrs	5
6	UE 2 – Material Environment	Databases	24 hrs	5
6	UE 3: Soft Skills	Personal Development and Corp. Culture	24 hrs	5
6	UE 3: Soft Skills	Personal and Professional Project	24 hrs	5
6	UE 3: Soft Skills	Lean Management	12 hrs	2
6	UE 3: Soft Skills	Sustainable Development	12 hrs	2
6	UE 3: Soft Skills	English Language	24 hrs	5