

UNDERGRADUATE COURSES TAUGHT IN ENGLISH



ENGINEERING SCIENCES

Pre-requisites

- ❖ High School diploma
- ❖ Basic knowledge in scientific fields

Presentation and objectives

Engineers today are not only conceiving and deploying new technologies internationally, they also create the world of tomorrow. In order for our future engineers to better grasp and face the challenges ahead, ESME Sudria's International Track undergraduate program provides students with the technical and scientific knowledge required to establish successful relationships with their international counterparts and peers.

In addition, through its many subjects taught by industry professionals and top academic faculty, the International Track undergraduate program also offers a solid understanding of contemporary global issues.

SPRING SEMESTER

Courses	Aims	Description	Credits
CRI - 'Learn By Doing (LBD)' Workshop - 30 hours (SUP)	By the end of the workshop, students will be more autonomous on the targeted research and tools needed to carry out technological projects.	ESME Sudria partners with the CRI (Centre de Recherche Interdisciplinaire) to offer this hands-on workshop in English. In groups, students try to create and / or improve technological solutions in order to reach the sustainable development goals set by the UN. 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.	7
IoT / Cybersecurity Workshop + Design Thinking - 24 hours (Ingé1)	At the end of the IoT workshop, students will be able to: - recognize new digital technologies and how they are used (IoT, machine learning, big data, cloud) and especially Raspberry Pi. - analyze and describe the various elements of an IoT chain - develop and deploy a simple wireless network, and connect it to the cloud for IoT application - recognize vulnerabilities in a system and begin to learn to protect systems	The workshop presents the technologies to make and exploit connected objects networks. In groups, students manipulate the different elements of an IoT chain (data acquisition, wireless transmission, network management, data analysis in the cloud, etc.) and experiment with the different elements of a complete IoT chain. Design thinking utilizes elements from the designer's toolkit such as empathy and experimentation to arrive at innovative solutions. Students will learn to frame a question, gather inspiration, generate ideas, make ideas tangible and test to learn.	7

<p>Computer Science (SUP) - 24 hours</p>	<p>By the end of the course, students will have grasped the basics of coding as well as gained autonomy.</p>	<p>Taught via a problem-based learning approach, students will learn to code and troubleshoot (Python).</p>	<p>4</p>
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Geopolitics - 12 hours (SUP)	The aims of this module are to help students: 1. To foster their interest and understanding of global issues in order to help them interpret and relate to the world around them. 2 To increase their cultural awareness in order to interact with others more effectively. 3 To develop a toolkit of practical international communication skills in order to prepare them for their international semester and future careers.	The course aims at increasing knowledge and understanding of international relations, geopolitics, current affairs, and global challenges. Students will do research, analyze, and debate international issues. They will also have to be proficient in giving oral presentations on international themes and in managing class discussion. The course is also aimed at teaching effective international communication: self-introduction, networking, debating, negotiating, presenting, conflict resolution, lobbying.	3
Critical & Creative Thinking - 18 hours (SPE)	The course aims at challenging preconceived notions on society and at helping students form educated and informed opinions on society and more particularly on science and technology.	Critical & Creative Thinking is designed as a follow-up course to International Communication. In-class conversations and debates will be carried out after source material is read.	3
English - 18 hours (SUP)	The English language SUP course is designed to primarily reinforce students' skills in the English language (oral and written comprehension, oral and written expression, and oral interaction) in order to prepare students for their future academic studies and careers.	Through projects and activities, students will practice their language skills	3

French as Foreign Language - 30 hours (SPE)		<p>At ESME Sudria, French as a Foreign Language is taught by professional French language instructors. Classes are adapted to students' level, based on the Common European Framework Reference for Languages (CEFR).</p>	<p>3</p>
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FALL SEMESTER

Courses	Aims	Description	Credits
Engineering Science (30 hours = 15 hours ES + 15 hour-project) (SUP)	By the end of the module students will have upgraded their knowledge and understanding of Mechanisms and Engineering systems as well as become familiar with the British approach to Engineering Science.	<p>This course is intentionally designed to include collaborative and team-based learning, experiential projects, and open-ended design. In this module, students will study and work on: Mechanisms.</p> <p>Types of motion Cams Levers (mechanical advantage, moments calculations) Linkages</p> <p>Gear systems Types of gears and their uses (worm, ratchet etc.) Pulleys Calculations for gears and pulleys (gear ratios etc.)</p> <p>Materials Woods (hardwoods, softwoods, manufactured boards) Metals (ferrous, non-ferrous, common alloys, finishing techniques) Plastics (thermoplastic vs thermosetting) Terms used to describe materials (brittle, malleable etc) Calculations (shear strength, yield etc.) Joining methods for timber, metal, plastic</p> <p>Manufacturing processes Advantages and disadvantages of each When to use, what materials can be used in each</p>	7

		Design projects 1 Design process Patents (searching, writing, application)	
IoT / Cybersecurity Workshop + Design Thinking - 24 hours (Ingé1)	At the end of the IoT workshop, students will be able to: - recognize new digital technologies and how they are used (IoT, machine learning, big data, cloud) and especially Raspberry Pi. - analyze and describe the various elements of an IoT chain - develop and deploy a simple wireless network, and connect it to the cloud for IoT application recognize vulnerabilities in a system and begin to learn to protect systems	The workshop presents the technologies to make and exploit connected objects networks. In groups, students manipulate the different elements of an IoT chain (data acquisition, wireless transmission, network management, data analysis in the cloud, etc.) and experiment with the different elements of a complete IoT chain. - Design thinking utilizes elements from the designer's toolkit such as empathy and experimentation to arrive at innovative solutions. Students will learn to frame a question, gather inspiration, generate ideas, make ideas tangible and test to learn.	7
Computer Science (SUP) - 24 hours	By the end of the course, students will have grasped the basics of coding as well as gained autonomy.	Taught via a problem-based learning approach, students will learn to code and troubleshoot (Python).	

Science & Society - 12 hours (SUP)	The course aims at challenging preconceived notions on society and at helping students form educated and informed opinions on society as well as on science and technology.	The course aims at increasing knowledge and understanding of international relations, geopolitics, current affairs, and global challenges. Students will do research, analyze, and debate international issues. They will also have to be proficient in giving oral presentations on international themes and in managing class discussion. The course is also aimed at teaching effective international communication: self-introduction, networking, debating, negotiating, presenting, conflict resolution, lobbying.	3
International Communication - 18 hours (SPE)	The aims of this module are to help students: 1. To foster their interest and understanding of global issues in order to help them interpret and relate to the world around them. 2 To increase their cultural awareness in order to interact with others more effectively. 3 To develop a toolkit of practical international communication skills in order to prepare them for their international semester and future careers.	The course aims at increasing knowledge and understanding of international relations, geopolitics, current affairs, and global challenges. Students will do research, analyze, and debate international issues. They will also have to be proficient in giving oral presentations on international themes and in managing class discussion. The course is also aimed at teaching effective international communication: self-introduction, networking, debating, negotiating, presenting, conflict resolution, lobbying.	3
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