

EXCHANGE PROGRAM 2020-21
Course Selection Instructions

The CentraleSupélec Engineering Curriculum spans over 3 years (6 semesters).

Each semester comprises 2 terms:

- an “Engineering Challenge” Term (in French *Séquence Thématique* or *ST*);
- an Academic Term (in French *Séquence Générale* or *SG*).

CentraleSupélec Engineering Curriculum in relation to the French/European system				Equivalent in the European higher education system	
Preparatory classes in France: "Prépa"	1st year	Semester 1	X	year 1	
		Semester 2			
	2nd year	Semester 3		year 2	
		Semester 4			
CentraleSupélec Engineering Curriculum	1st year	Semester 5 - S5	SG 1	year 3	BSc
			ST 2		
		Semester 6 - S6	SG 3		
			ST 4		
	2nd year	Semester 7 - S7 FALL	ST 5	year 4	MSc
			SG 6		
		Semester 8 - S8 SPRING	ST 7		
			SG 8		
	3rd year	Semester 9 - S9	SD9	year 5	
			SM 10		
Semester 10 - S10		SM11			
		Internship			

The second year at CentraleSupélec is open to exchange students who come either for the Fall Semester “S7” (September to January) or the Spring Semester “S8” (February to June), or both.

Detailed course descriptions can be found in the catalogue 2019-2020 (2nd year section).

To know the language of instruction for each course, please refer to the available course list for 2020-21.

Please note that changes can still occur before your arrival.

FALL SEMESTER S7: ORGANIZATION & SELECTION OF COURSES

You are free to select any course from this program, taking into consideration several rules explained below. The full course load of the engineering program is usually 30 ECTS per semester. Depending on the requirements of your home institution, you may either take the full course load, or choose a minimum of 24 ECTS. The school has 3 campuses: Saclay, Rennes and Metz. **Be sure to choose a full set of courses in one campus only.**

This document is for information purposes only. Wishes regarding course choices will be made online via a link sent to nominated candidates.

“Engineering Challenge” Term, or *Séquence Thématique*: ST5

This term runs from September to mid-November, and comprises:

- A course series including:
 - An introductory module
 - A specific course
 - A Challenge Week, in French *Enseignement d'intégration*, scheduled at the end of the term (**choice of challenge week topic will be made upon arrival**)
- A common course: Automatic Control

Students are invited to choose 1 of the 14 “ST” topics, as well as a back-up in case their top choice cannot be accommodated.

The Automatic Control course is not mandatory, but it is a prerequisite for the ST: **you must attend it if you do not have the sufficient background in this field.**

Academic Term, or *Séquence Générale*: SG6

This term runs from late November to late January, and comprises:

- 3 elective courses

The courses are distributed in 3 electives series: 2.1, 2.2 and 2.3. All courses from a given series are scheduled in the same time slot.

Please select 1 “top” choice + 1 “back-up” per series.

The semester also includes:

- A 1-week seminar in early September: **Business Games**
- An **intensive 1-week seminar** scheduled late November, mainly on themes related to the social sciences and humanities. If you are interested in this seminar, you may select **1** topic from the list
- Semester-long courses: **Economics, Law, and Sociology of Organizations**
- **Language courses:** Students choose at least 1, and up to 2 foreign language(s) from the list. Priority is given to French and English. If you are already fluent in the latter, you may skip the language courses, or choose another language. You cannot select a language in which you are a native speaker.
- **Workshops:** Engineering Skills Workshops (“API”) and Professional Practice Skills Workshops (“APP”).
- **Sports:** CentraleSupélec offers a range of sports courses which international students are encouraged to join, but for which they do not receive ECTS. If you are interested, please visit the Sports Office when you arrive on campus.

COURSE LIST FOR ACADEMIC YEAR 2020 - 2021 : FALL SEMESTER / "S7"

F: French E: English F*: Lectures in French, course material in English

SEQUENCE THEMATIQUE "ST5" / ENGINEERING CHALLENGE TERM							
Choice 1	Choice 2	FR Course title	Eng Course title	Course code	ECTS	Campus	Language of Instruction
<input type="checkbox"/>	<input type="checkbox"/>	Pilotage et contrôle de vol dans le transport aéronautique et spatial: Intro: module contexte et enjeu Performances et trajectoires de vol Stratégie de contrôle d'un nanosatellite ou Définition et conception de la mission d'un lanceur ou Conception d'un avion	Flight Control in Aeronautical and Space Transport: Introductory module Performance and flight paths Control Strategy of a Nanosatellite OR Definition and Design of a Launcher Mission OR Aircraft Design	ST 51 2SC5100 2SC5110 2SC5191 2SC5192 2SC5193	5 0,5 2,5 2 2 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Commande de bioprocédés pour produire durable: Intro: module contexte et enjeu Ingénierie des procédés: application à l'environnement et aux productions durables ou Traitement biologique optimisé des eaux résiduaires urbaines ou Procédé innovant de fermentation continue de levain ou Supervision avancée de la production de biogaz à partir de déchets	Bioprocess Control for Sustainable Production: Introductory module Chemical Engineering: application to environment and sustainable production OR Optimized biological treatment of urban wastewater OR Innovative Process of Continuous Sourdough Fermentation OR Advanced Supervision of Biogas Production from Waste	ST 52 2SC5200 2SC5210 2SC5291 2SC5292 2SC5293	5 0,5 2,5 2 2 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Véhicule intelligent et communicant: Intro: module contexte et enjeu Architecture et technologies pour le véhicule intelligent et communicant Livraison urbaine par véhicules autonomes et connectés	Smart and Communicating Vehicle: Introductory module Architecture and technologies of smart and communicating vehicles Urban Delivery by autonomous and connected vehicles	ST 53 2SC5300 2SC5310 2SC5390	5 0,5 2,5 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	L'éco-quartier, un système complexe. Aménagement durable & management de projet complexe: Intro: module contexte et enjeu Aménagement et urbanisme durables Projet de conception d'un éco-quartier	Ecological District, a Complex System. Sustainable Management and Complex Project Management: Introductory module Sustainable Urban Planning Eco-district Design Project	ST 54 2SC5400 2SC5410 2SC5490	5 0,5 2,5 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Lumière et matière: développement d'instruments de haute technologie: Intro: module contexte et enjeu Physique de la matière Conception d'un faisceau de rayons X Synchrotron ou Lasers à cascade quantique	Light and Matter: Development of High Technology Instruments: Introductory module Physics of Matter Synchrotron X-ray Beamline Design OR Quantum Cascade Lasers	ST 55 2SC5500 2SC5510 2SC5591 2SC5592	5 0,5 2,5 2 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes multi-énergies: Intro: module contexte et enjeu Introduction à la production d'énergie Régulation et commande de systèmes de production et de conversion d'énergie ou Groupe motopropulseur hybride ou Propulsion aéronautique hybride	Multi-Energy Systems: Introductory module Introduction to Energy Production Regulation and Control of Energy Production and Conversion Systems OR Hybrid Power Train OR Hybrid Aeronautical Propulsion	ST 56 2SC5600 2SC5610 2SC5691 2SC5692 2SC5693	5 0,5 2,5 2 2 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Contrôle de la pollution acoustique et électromagnétique: Intro: module contexte et enjeu Théorie et algorithmique pour le contrôle des ondes	Control of Acoustic and Electromagnetic Pollution: Introductory module Theory and Algorithms for wave control	ST 57 2SC5700 2SC5710	5 0,5 2,5	Paris Saclay	F

challenge week to be chosen upon arrival		Contrôle de la pollution acoustique extérieure ou Contrôle de la pollution acoustique intérieure ou Contrôle de la pollution électromagnétique	Control of External Acoustic Pollution OR Indoor Noise Pollution Control OR Control of Electromagnetic Pollution	2SC5791 2SC5792 2SC5793	2 2 2		
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes complexes industriels et critiques à logiciels prépondérants: Intro: module contexte et enjeu Conception et vérification de systèmes critiques Conception d'un système de signalisation sûre pour le ferroviaire ou Système intelligent pour le contrôle automatisé du trafic aérien ou Systèmes de production pour "usines intelligentes"	Industrial Complex and Critical Systems with Prepondering Softwares: Introductory module Design and verification of critical systems Design of a Safe Signalling System for the Railway OR Intelligent System for Automated Control of Air Traffic OR Production Systems for "smart factories"	ST 58 2SC5800 2SC5810 2SC5891 2SC5893 2SC5894	5 0,5 2,5 2 2 2	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Assistance et autonomie de la personne: Intro: module contexte et enjeu Commande d'une chaîne de motorisation Fauteuil roulant motorisé pour personne handicapée	Assistance and Autonomy of the Person: Introductory module Control of a motorization chain Motorized Wheelchair for Disabled Person	ST 59 SC5900 2SC5910 2SC5990	5 0,5 2,5 2	Metz	F
<input type="checkbox"/>	<input type="checkbox"/>	Navigation semi-autonome de drones: Intro: module contexte et enjeu Robotique autonome Navigation semi-autonome de drones en environnement intérieur	Semi-Autonomous UAV Navigation: Introductory module Autonomous Robotics Semi-autonomous UAV indoor navigation	ST 60 2SC6000 2SC6010 2SC6090	5 0,5 2,5 2	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes photoniques intelligents de commande et de mesure: Intro: module contexte et enjeu Photonique pour le contrôle des systèmes physiques Télé-détection laser (LIDAR)	Intelligent Control and Measurement Photonic Systems: Introductory module Photonics for the control of physical systems Laser Remote Sensing (LIDAR)	ST61 2SC6100 2SC6110 2SC6190	5 0,5 2,5 2	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Intelligence énergétique et smart building: Intro: module contexte et enjeu Communications à haute performance énergétique OU Modélisation Systèmes Pilotage hiérarchisé du confort thermique	Energy Intelligence and Smart Building: Introductory module High energy performance communications OR System Modelling Hierarchical control of thermal comfort	ST62 2SC6200 2SC6210 or 2SC6290	5 0,5 2,5 2	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes intelligents et embarqués pour la santé: Intro: module contexte et enjeu Communications à haute performance énergétique OU Modélisation Systèmes Système intelligent pour la régulation personnalisée de glycémie	Intelligent and Embedded Healthcare Systems: Introductory module High energy performance communications OR System Modelling Smart System for personalized blood glucose control	ST63 2SC6300 2SC6210 or 2SC6390	5 0,5 2,5 2	Rennes	F
<input type="checkbox"/>	<input type="checkbox"/>	Modélisation et conception d'un système de supervision de capteurs: Intro: module contexte et enjeu Modèles de données et schémas de conception Développement d'un système de supervision de capteurs	Modeling and Design of a Sensor Supervision System: Introductory module Data Models and design schemes Development of a sensor monitoring system	ST64 2SC6400 2SC6410 2SC6490	5 0,5 2,5 2	Rennes	F

COURS DE TRONC COMMON / COMMON CORE COURSES

Choices	FR Course title	Eng Course title	Course code	ECTS	Campus	Language of Instruction
<input type="checkbox"/> E <input type="checkbox"/> F	Automatique	Automatic Control	2CC1000	2,5	all	E or F in P-Saclay and Rennes, F in Metz

<input type="checkbox"/> E	<input type="checkbox"/> F	Modélisation Systèmes	Systems Modelling	2CC2000	0	all	E or F in P-Saclay, F in Rennes and Metz
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SEQUENCE GENERALE "SG6" / ACADEMIC TERM							
ELECTIVE SERIES 2.1							
Choice 1	Choice 2	FR Course title	Eng Course title	Course Code	ECTS	Campus	Language of Instruction
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes Dynamiques en Neurosciences	Dynamical systems in neurosciences	2EL1110	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Exposition des personnes à l'électromagnétisme et compatibilité électromagnétique	Human exposure to electromagnetic fields and Electromagnetic compatibility	2EL1210	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conversion d'énergie	Energy conversion	2EL1320	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Mécanique des Fluides	Fluid Mechanics	2EL1420	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Distribution et opérateurs	Distribution et opérateurs	2EL1720	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Vibration structurelle et acoustique	Structural vibration and acoustics	2EL1810	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Compréhension, optimisation et simulation des procédés biotechnologiques	Understanding, optimisation and simulation of biotechnological processes	2EL2010	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Economie de l'innovation et de la croissance	Innovation Economics - Economic growth	2EL2170	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Capteurs intégrés MEMS	MEMS Integrated Sensors	2EL2530	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Réseaux de communication mobiles et services	Mobile communication networks and services	2EL2620	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conception de systèmes électroniques complexes: du composant au système hétérogène	Design of Complex Electronic Systems: from Component to Heterogenous System	2EL5090	2,5	Metz	F
<input type="checkbox"/>	<input type="checkbox"/>	Traitement de l'image	Digital Image Processing	2EL5070	2,5	Metz	F
<input type="checkbox"/>	<input type="checkbox"/>	La lumière pour comprendre la matière	Using Light to understand Matter	2EL5110	2,5	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Architecture des ordinateurs	Computer architecture	2EL6020	2,5	Rennes	F
<input type="checkbox"/>	<input type="checkbox"/>	Modélica et bond graph: modélisation multi-domaine, analyse et simulation	Modelica and bond graph: multidomain modellisation, analysis and simulation	2EL6050	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>	Economie de l'innovation	Economy of Innovation	2EL6160	2,5	Rennes	E
ELECTIVE SERIES 2.2							
Choice 1	Choice 2	FR Course title	Eng Course title	Course Code	ECTS	Campus	Language of Instruction
<input type="checkbox"/>	<input type="checkbox"/>	Transferts thermiques	Heat transfer	2EL1410	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Génie logiciel orienté objet	Object oriented programming	2EL1520	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Modèles et systèmes pour la gestion de données massives	Big Data management	2EL1560	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Machine learning	Machine Learning	2EL1730	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Mécanique avancée pour le génie civil: "Construire sur Mars"	Advanced Mechanics for Civil engineering	2EL1840	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Physique quantique et statistique (part II)	Quantum and Statistical Physics part II	2EL1920	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Finance et droit de l'entreprise	Corporate finance and Law	2EL2150	2,5	Paris Saclay	E + 1 lecture in F
<input type="checkbox"/>	<input type="checkbox"/>	Analyse et traitement de l'image	Analysis and audio file formatting	2EL5060	2,5	Metz	F*
<input type="checkbox"/>	<input type="checkbox"/>	De l'atome aux composants électroniques	From atom to electronic devices	2EL5100	2,5	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Conception de systèmes embarqués critiques de contrôle commande	Model based Design of Embedded Control Systems	2EL6010	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>	Méthodes numériques	Numerical Methods	2EL6080	2,5	Rennes	F
<input type="checkbox"/>	<input type="checkbox"/>	Nouveaux paradigmes réseau	New Network Paradigms	2EL6110	2,5	Rennes	F

ELECTIVE SERIES 2.3							
Choice 1	Choice 2	FR Course title	Eng Course title	Course Code	ECTS	Campus	Language of Instruction
<input type="checkbox"/>	<input type="checkbox"/>	Milieux réactifs	Reactive Media	2EL1440	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Calcul haute performance	High Performance Computing	2EL1550	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Probabilités avancées	High level Probabilities	2EL1710	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Comportement non-linéaire des matériaux	Non-linear behaviour of materials	2EL1830	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Génomique et biologie synthétique en biotechnologie sanitaire et industrielle	Genomics and synthetic biology in health and industrial biotechnology	2EL2030	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Science de la conception	Design Science	2EL2120	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Stratégie, Marketing et Organisation	Marketing Strategy and Organisation	2EL2140	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Compression et débruitage des signaux	Signal compression and denoising	2EL2410	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Architecture et conception des systèmes numériques	Architecture and design of digital systems	2EL2510	2,5	Paris Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Théorie des communications	Theory of communications	2EL2610	2,5	Paris Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Introduction à l'ingénierie des applications mobiles	Introduction to engineering of Mobile App	2EL5010	2,5	Metz	F*
<input type="checkbox"/>	<input type="checkbox"/>	Méthodes d'estimations et introduction à la théorie moderne du codage	Estimation methods and introduction to modern theory of coding	2EL5050	2,5	Metz	F
<input type="checkbox"/>	<input type="checkbox"/>	Intelligence artificielle et deep learning	Artificial Intelligence and Deep Learning	2EL6090	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>		Communication Systems Engineering	2EL6100	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>		Digital Marketing	2EL6180	2,5	Rennes	F

ENSEIGNEMENTS HORS SEQUENCE / SEMESTER-LONG COURSES							
Multiple choices possible		FR Course title	Eng Course title	Course code	ECTS	Campus	Language of Instruction
<input type="checkbox"/> E	<input type="checkbox"/> F	Economie	Economics	2SL1000	2,5	all	E or F in P-Saclay, F in Metz, F* in Rennes
	<input type="checkbox"/>	Droit	Law	2SL2000	1,5	all	F in P-Saclay and Metz, E in Rennes
	<input type="checkbox"/>	Sociologie des Organisations	Sociology of Organizations	2SL4000	1,5	all	F in P-Saclay and Metz, F* in Rennes
	<input type="checkbox"/>	Ateliers Pratiques Ingénieur - API	Engineering Skills Workshops	2SL5000	1	all	F
	<input type="checkbox"/>	Ateliers Pratique Professionnelle - APP	Professional Practice Workshops	2SL7000	1	all	F
	<input type="checkbox"/>	Modélisation pour l'Ingénierie des Systèmes	Modeling for Systems Engineering			Metz	F*, or E if enough students ask for it
		Sport	Sports	2SL9000	0	all	

INTENSIVE SEMINAR COURSES							
Choice	FR Course title	Eng Course title	Course code	ECTS	Campus	Language of Instruction	
<input type="checkbox"/>	Jeux d' Entreprise	Business Games	2IN4000	2,5	all	F	
Choice (1 max)	FR Course title	Eng Course title	Course code	ECTS	Campus	Language of Instruction	
<input type="checkbox"/>	Individus, Travail, Organisations	Individual, Work and Organisation (course series)	2IN2310	2,5	Paris Saclay	F or E depending on course	

<input type="checkbox"/>	Enjeux de société	Perspective on key social issues (course series)	2IN2320	2,5	Paris Saclay	F or E depending on course
<input type="checkbox"/>	Science, Technologie, Société	Science, Technology, Society (course series)	2IN2330	2,5	Paris Saclay	F or E depending on course
<input type="checkbox"/>	Innovation, Arts et Créativité	Innovation, Arts and Creativity (course series)	2IN2340	2,5	Paris Saclay, Rennes	F or E depending on course
<input type="checkbox"/>	Design your way	Design your way	2EL2710	2,5	Paris Saclay	F
<input type="checkbox"/>	Comprendre la blockchain	Understanding Blockchain	2IN1510	2,5	Paris Saclay	F
<input type="checkbox"/>	Les défis du monde contemporain		2IN5105	2,5	Metz	F
<input type="checkbox"/>	Introduction to marketing		2IN5106	2,5	Metz	F

LANGUAGE COURSES						
Choices (max. 2)	FR Course title	Eng Course title	Course code	ECTS	Campus	Language of Instruction
<input type="checkbox"/>	Français Langue Etrangère - FLE	French	2LC0100	1,5	all	N.A
<input type="checkbox"/>	Anglais	English	2LC0200	1,5	all	N.A
<input type="checkbox"/>	Allemand	German	2LC0300	1,5	all	N.A
<input type="checkbox"/>	Espagnol	Spanish	2LC0400	1,5	all	N.A
<input type="checkbox"/>	Italien	Italian	2LC0500	1,5	all	N.A
<input type="checkbox"/>	Portugais	Portuguese	2LC0600	1,5	Paris-Saclay	N.A
<input type="checkbox"/>	Chinois	Chinese	2LC7000	1,5	all	N.A
<input type="checkbox"/>	Japonais	Japanese	2LC0800	1,5	all	N.A
<input type="checkbox"/>	Russe	Russian	2LC0900	1,5	P-Saclay and Metz	N.A
<input type="checkbox"/>	Arabe	Arabic	2LC1000	1,5	P-Saclay and Rennes	N.A
<input type="checkbox"/>	Hébreu	Hebrew	2LC1200	1,5	P-Saclay	N.A