



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	BSc	
		Semester 2				
	2nd year	Semester 3		year 2		
		Semester 4				
CentraleSupélec Engineering Curriculum	1st year	Semester 5 - S5	SG 1	year 3		MSc
			ST 2			
		Semester 6 - S6	SG 3			
			ST 4			
	2nd year	Semester 7 - S7 FALL	ST 5	year 4		
			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.

SPRING SEMESTER S8: ORGANISATION & 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. Please note that we have 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*: ST7

This term runs from February to late March, and comprises:

- A course series including:
 - An introductory module
 - A specific course
 - A short project or in French *Projet de Séquence* (**choice of short project will be made upon arrival**)
- A common course: Optimization

Students are invited to choose 1 of the 11 “ST” topics, as well as a back-up in case their top choice cannot be accommodated.

The Optimization course is not mandatory, but it is a prerequisite for the ST: **you must attend it if you don’t have the sufficient background in this field.**

An Academic Term, or *Séquence Générale*: SG8

This term runs from April to mid-June, and comprises:

- 3 elective courses

The courses are distributed in 3 electives series: 2.4, 2.5 and 2.6. 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 “**Long Project**” that runs over the whole semester. Students are offered a list of topics to choose from at the beginning of the semester;
- **Workshops:** Engineering Skills Workshops (“*API*”) and Professional Practice Skills Workshops (“*APP*”). **Please note that the Engineering Skills Workshop is mandatory for students involved in a long project;**
- An **intensive 1-week seminar** scheduled mid-June: if you are interested in this seminar, you may select **1** topic from the list.
- A **Philosophy** course
- **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 choose a language of which you are a native speaker.
- **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 : SPRING SEMESTER / "S8"

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

SEQUENCE THEMATIQUE "ST7" / 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"/>	Modélisation mathématique des marchés financiers et gestion des risques: Intro: module contexte et enjeu Modélisation des risques financiers Minimisation des risques sur les marchés financiers	Mathematical Modelling of Financial Markets and Risk Management: Introductory module Financial Risk Modelling Minimization of Risks on the Financial Markets	ST71 2SC7100 2SC7110 2SC7190	7,5 2,5 5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Optimisation de l'infrastructure des réseaux pour les villes intelligentes: Intro: module contexte et enjeu Optimisation des infrastructures de réseau Smart cities: les cités connectées	Optimising Network Infrastructure for Smart Cities : Introductory module Optimisation of Network Infrastructures Smart Cities : Connected Cities	ST72 2SC7200 2SC7210 2SC7290	7,5 2,5 5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Economie circulaire et systèmes industriels: Intro: module contexte et enjeu Economie circulaire et méthodes de l'écologie industrielle Bioraffinerie: optimisation des flux et/ou des procédés associés ou Traitement des déblais des tunnels du Grand Paris	Circular Economy and Industrial Systems: Introductory module Circular Economy and Methods of Industrial Ecology Biorefinery: Optimization of flows and/or associated processes OR Treatment of Excavated Material in the Tunnels of Grand Paris	ST73 2SC7300 2SC7310 2SC7391 2SC7393	7,5 2,5 5 5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Optimisation de systèmes de transports passagers: Intro: module contexte et enjeu Aide à la décision/Recherche opérationnelle Optimisation des opérations d'une compagnie aérienne ou Optimisation des trajectoires des avions à l'approche d'un aéroport ou Optimisation de systèmes de transport à la demande	Optimisation of Passenger Transport Systems: Introductory module Decision Support/Operational Research Optimizing the operations of an airline OR Optimization of aircraft paths when approaching an airport OR Organization of on-demand transport systems	ST74 2SC7400 2SC7410 2SC7491 2SC7492 2SC7493	7,5 2,5 5 5 5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Optimisation et gestion de flux de systèmes complexes: Intro: module contexte et enjeu Optimisation et gestion de flux Optimisation et gestion de flux ou Gestion des flux en milieu hospitalier	Optimisation and Management of Complex Systems Flows: Introductory module Managing and optimizing industrial flows Optimization and Flow Management OR Flow Management in an Hospital Environment	ST75 2SC7500 2SC7510 2SC7591 2SC7592	7,5 2,5 5 5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Simulation à haute performance pour la réduction d'empreintes: Intro: module contexte et enjeu Méthodes et algorithmes parallèles - Algorithmique et programmation parallèles et distribuées Réduction du coût d'une campagne d'exploration sismique ou Optimisation de formes et réduction de la traînée en aéronautique ou	High Performance Simulation for Footprint Reduction: Introductory module Parallel Numerical Methods; Parallel and Distributed Algorithms and Programming Cost optimization of a seismic exploration campaign OR Shape optimization and drag reduction in aeronautics OR	ST76 2SC7600 2SC7610 2SC7691 2SC7692	7,5 2,5 5 5	Paris-Saclay	F*

		Optimisation de détection d'ondes infrasonores pour la vérification du traité d'interdiction complète d'essais nucléaires ou	Optimization of infrasonic wave detection for verification of the Comprehensive Nuclear-Test-Ban-Treaty OR	2SC7693	5		
		Optimisation énergétique et accélération d'un graphe de calculs financiers sur cloud ou	Energy optimization and acceleration of a cloud financial calculation graph OR	2SC7694	5		
		Optimisation à faible coût des performances d'un code de propagation d'ondes acoustiques	Low cost optimization of acoustic wave propagation code performance	2SC7695	5		
<input type="checkbox"/>	<input type="checkbox"/>	Efficacité des systèmes d'énergie embarqués: Intro: module contexte et enjeu Méthodes numériques et résolution des problèmes d'optimisation des systèmes d'énergie embarqués Efficacité énergétique de machines électriques de traction ou Optimisation de chaîne de traction sur cycle routier ou Gestion optimale d'un véhicule hybride ou Efficacité énergétique d'un générateur de puissance pour satellite	Onboard Energy Systems Efficiency: Introductory module Numerical Methods and Problem Solving for Optimizing Embedded Energy Systems Energy Efficiency of Electric Traction Machines OR Traction Chain Optimisation on Road Cycle OR Optimal Management of a Hybrid Vehicle OR Energy efficiency of a satellite power generator	ST77 2SC7700 2SC7710 2SC7791 2SC7792 2SC7793 2SC7794	7,5 2,5 5 5 5 5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conception en fabrication additive: Intro: module contexte et enjeu Couplages multiphysiques pour la fabrication additive Optimisation de pièces aéronautiques en fabrication additive métallique ou Optimisation de pièces pour le biomédical en fabrication additive polymère ou Optimisation de structures en génie civil en fabrication additive béton	Additive Manufacturing Design : Introductory module Multiphysics Couplings for Additive Manufacturing Optimisation of Aeronautical Parts in Additive Manufacturing OR Optimisation of Biomedical Parts in Polymer Additive Manufacturing OR Optimisation of Civil Engineering structures in Concrete Additive Manufacturing	ST81 2SC8100 2SC8110 2SC8191 2SC8192 2SC8193	7,5 2,5 5 5 5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Smart grids et défi énergétique: gestion de l'énergie en site isolé Intro: module contexte et enjeu Energies renouvelables et Micro grids Micro grid insulaire décarbonné	Smart Grids and Energy Challenge: Energy Management in Isolated Area Introductory module Renewable Energies and Micro grids Insular carbon-free micro grid	ST78 2SC7800 2SC7810 2SC7890	7,5 2,5 5	Rennes	F*
<input type="checkbox"/>	<input type="checkbox"/>	Le numérique au service du facteur humain Intro: module contexte et enjeu Analyse d'image et son 2D-3D Ce que vous dites sans le vouloir: décryptage et analyse automatique des comportements non verbaux	Digital Technology Serving the Human World Introductory module 2D – 3D Image and Sound Analysis What you Unwittingly Say: Decryption and Automatic Analysis of Nonverbal behaviors	ST79 2SC7900 2SC7910 2SC7990	7,5 2,5 5	Rennes	F*
<input type="checkbox"/>	<input type="checkbox"/>	Séparation de sources pour une exploitation optimale des signaux: Intro: module contexte et enjeu Représentations parcimonieuses des signaux Suivi d'un locuteur par un robot ou Séparation de sources sonores à partir d'enregistrements de plusieurs microphones	Source Separation for optimal signal operation : Introductory module Sparse Representation of Signals Sub-surface imagery for oil exploration from seismic data acquired in simultaneous source mode OR Tracking a speaker by a robot OR Separation of sound sources from recordings of several microphones	ST80 2SC8000 2SC8010 2SC8091 2SC8092 2SC8093	7,5 2,5 5 5 5	Metz	F*

COURS DE TRONC COMMON / COMMON CORE COURSES							
Choice		Cours de Tronc Commun	Common core courses	Course code	ECTS	Campus	Language of instruction
<input type="checkbox"/> E	<input type="checkbox"/> F	Optimisation	Optimisation	2CC3000	2,5	all	E or F

SEQUENCE GENERALE "SG6" / ACADEMIC TERM							
ELECTIVE SERIES 2.4							
Choice 1	Choice 2	FR Course title	Eng Course title	Course Code	ECTS	Campus	Language of instruction
<input type="checkbox"/>	<input type="checkbox"/>	Energies renouvelables	Renewable Energies	2EL1210	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conversion d'énergie	Energy Conversion	2EL1320	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Intelligence artificielle	Artificial Intelligence	2EL1580	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Calcul scientifique	Scientific Computation	2EL1760	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Construire la ville - urbanisme, architecture et ingénierie	Building the city – town planning, architecture and engineering	2EL1860	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Lois fondamentales de l'univers: physique des particules et de la gravitation	Fundamental Laws of the Universe: Particle and Gravitation Physics	2EL1910	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Management agile de projets complexes	Agile Management of Complex Projects	2EL2130	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conception d'Innovation Radicale	Radical Innovation Design*	2EL2200	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Gestion des opérations et de la chaîne logistique	Supply Chain Operations Management	2EL2210	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Traitement d'images numériques	Digital Image Processing	2EL2420	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Introduction au développement d'applications basées sur les services	Introduction to service-based applications development	2EL5020	2,5	Metz	F*
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes photoniques intelligents	Smart Photonics Systems	2EL5120	2,5	Metz	F*
<input type="checkbox"/>	<input type="checkbox"/>	Serious Game	Serious Game	2EL6060	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes embarqués et internet des objets	Embedded Systems and Internet of Things	2EL6130	2,5	Rennes	F
ELECTIVE SERIES 2.5							
Choice 1	Choice 2	FR Course title	Eng Course title	Course Code	ECTS	Campus	Language of instruction
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes Robotiques Interactifs	Interactive Robotic Systems	2EL1120	2,5	Paris- Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Conception d'antenne pour applications avancées	Antenna Design for Advanced Applications	2EL1220	2,5	Paris- Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Transferts thermiques	Heat Transfer	2EL1410	2,5	Paris- Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Cloud computing et informatique distribuée	Cloud Computing and Decentralised Computing	2EL1590	2,5	Paris- Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Statistiques Avancées	Advanced Statistics	2EL1750	2,5	Paris- Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Matériaux du vivant	Life Materials	2EL1820	2,5	Paris- Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Physique de la matière divisée	Physics of Divided Matter	2EL2020	2,5	Paris- Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Ingénierie des procédés au service du développement durable	Chemical Engineering: application to environment and sustainable production	2EL2040	2,5	Paris- Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Economie de l'environnement, énergie et développement durable	Economics of the environment, energy and sustainable development	2EL2160	2,5	Paris- Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conception d'Innovation Radicale	Radical Innovation Design*	2EL2200	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Du transistor au système analogique complexe	From Transistor to Complex Analog Device	2EL2520	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Programmer efficacement en C++	Efficient Programming in C/C++	2EL5030	2,5	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Chao, Fractales et complexité	Chaos, Fractal and Complexity	2EL5130	2,5	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Les radiocommunications	Radiocommunications	2EL6120	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>	Commande prédictive	Model Based Predictive Control	2EL6150	2,5	Rennes	E

ELECTIVE SERIES 2.6							
Choice 1	Choice 2	FR Course title	Eng Course title	Course Code	ECTS	Campus	Language of instruction
<input type="checkbox"/>	<input type="checkbox"/>	Analyse, optimisation et coordination/pilotage des systèmes dynamiques multi-agents	Analysis, Optimisation and Coordination / Control of Dynamic Multi-agent Systems - Application to the formation of Drones	2EL1130	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Ingénierie Nucléaire	Nuclear Engineering	2EL1430	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Génie logiciel orienté objet	Object Oriented Software Engineering	2EL1520	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Informatique théorique	Theoretical Computer science	2EL1540	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Algèbre et cryptologie	Algebra and Cryptology	2EL1740	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Simulation des couplages multiphysiques avec la MEF	Multiphysics Coupling Simulation with Finite Element Method	2EL1850	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Management de l'innovation et création d'entreprise	Innovation Management and Business Creation	2EL2190	2,5	Paris-Saclay	F
<input type="checkbox"/>	<input type="checkbox"/>	Conception d'Innovation Radicale	Radical Innovation Design*	2EL2200	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Application de la physique statistique au traitement de l'information	Applications of Statistical Physics to Information Processing	2EL2630	2,5	Paris-Saclay	E
<input type="checkbox"/>	<input type="checkbox"/>	Big Data: collecte, stockage et analyse de données sur cluster et cloud	Big Data: Collection, Storage and Analysis of Data on Clusters and Cloud	2EL5040	2,5	Metz	E
<input type="checkbox"/>	<input type="checkbox"/>	Systèmes embarqués électroniques et information robustes	Robust Electronic and Embedded Systems	2EL5080	2,5	Metz	F
<input type="checkbox"/>	<input type="checkbox"/>	Réalité virtuelle et augmentée	Virtual and Augmented Reality	2EL6070	2,5	Rennes	E
<input type="checkbox"/>	<input type="checkbox"/>	Micro-grid	Micro-Grid	2EL6140	2,5	Rennes	E

* The Radical Innovation Design course must be taken throughout the elective series period (2.4, 2.5 and 2.6)

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"/>	Philosophie	Philosophy	2SL3000	2	all	F
<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	0,5	all	F
<input type="checkbox"/>	Projet Long	Long Project (S8)	2SL8100	9	all	E or F depending on topic or team
<input type="checkbox"/>	Algorithmique	Algorithmics			Rennes	E
<input type="checkbox"/>	Sport	Sports	2SL9000	0	all	

INTENSIVE SEMINAR COURSES						
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	Paris-Saclay	F or E depending on course
<input type="checkbox"/>	Enjeux de société	Perspective on key social issues (course series)	2IN2320	2	Paris-Saclay	F or E depending on course
<input type="checkbox"/>	Science, Technologie, Société	Science, Technology, Society (course series)	2IN2330	2	Paris-Saclay	F or E depending on course
<input type="checkbox"/>	Innovation, Arts et Créativité	Innovation, Arts and Creativity (course series)	2IN2340	2	Paris-Saclay	F or E depending on course
<input type="checkbox"/>	Gestion des Achats	Procurement Management	2IN2180	2	Paris-Saclay	E

<input type="checkbox"/>	Développement d'applications web et mobile	Web and Mobile application development	2IN1570	2	Paris-Saclay	F
<input type="checkbox"/>	Bridge building challenge	Bridge Building challenge	2IN5010	2	Paris-Saclay	F*
<input type="checkbox"/>	Travail expérimental de physique	Experimental work in Physics	2IN5030	2	Paris-Saclay	F*
<input type="checkbox"/>	Enseignement expérimental en transmission d'information	Experimental work in information transmission	2IN5040	2	Paris-Saclay	F*
<input type="checkbox"/>	Métier de l'ingénieur, Ethique et Responsabilité	Engineer, Ethics and Responsibility	2IN2350	2	Paris-Saclay	F
<input type="checkbox"/>		Marketing		2	Metz	F
<input type="checkbox"/>		Finances Publiques		2	Metz	F
<input type="checkbox"/>	En attente de confirmation	Pending confirmation		2	Rennes	

LANGUAGE COURSES						
Choices (max. 2)	FR Course name	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	P-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 Rennes	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.