Academic year 2020/2021

LAST NAME		**FIRST NAME**	
NAME OF THE SENDING INSTITUTION			
SENDING INSTITUTION SUPERVISOR'S NAME AND EMAIL			
ENSCL SUPERVISOR			
PLANNED PERIOD OF THE MOBILITY	**FROM**		**TILL (MONTH/YEAR)**

Double degree students will have the same workload as a typical French higher education student. It means you will have to validate 30 ECTS credits per semester.
All selected courses and projects must be discussed by your ENSCL academic supervisor upon arrival. Modifications can be done at the latest 1 month after arrival.

Teaching Units	Modules	Code	Semester	ECTS	Select your courses by ticking the boxes below	Language (1)
Analytical Chemistry	Electrochemistry in solution and electrochemical methods	5.1.1	S5	7		F
	Experimental and analytical chemistry	5.1.2	S5			F
Spectroscopy and organic chemistry	Structure and reactivity of organic molecules	5.2.1	S5	5		F
	Applied molecular spectroscopy	5.2.2	S5			F
Physical Chemistry	Thermochemistry (In class + self-study)	5.3.1	S5	7		F
	Kinetics (In class + self-study)	5.3.2	S5			F
	Experimental physical chemistry	5.3.3	S5			F
Chemical Enginee-ring - 1	Fluid mechanics and hydrodynamics	5.4.1	S5	4		F
	Heat transfers and exchangers devices	5.4.2	S5			F
	Experimental chemical engineering	5.4.3	S5			F
Languages – 1	LV 1 – English	5.5.1	S5	4		
	LV 2 – German	5.5.2	S5			
	LV 2 – Spanish	5.5.3	S5			
	French as a foreign language	5.5.4	S5			
	Optional: 3rd language	5.5.5	S5			
Job training, Huma-nities	3P(2) / Sustainable development	5.6.1	S5	3		F/E
	Project management	5.6.2	S5			F
	Applied statistics and data processing	5.6.3	S5			F

Teaching Units	Modules	Code	Semester	ECTS	Select your courses by ticking the boxes below	Language
Organic and macro-molecular Chemistry	Advanced organic chemistry	6.1.1	S6	8		F
	Organometallic chemistry	6.1.2	S6			F
	Introduction to polymer chemistry	6.1.3	S6			F
	Experimental organic chemistry	6.1.4	S6			F
Inorganic chemistry	Introduction to solid state chemistry	6.2.1	S6	8		F
	Cristallography	6.2.2	S6			F/E
	Inorganic and industrial chemistry	6.2.3	S6			F/E
	Experimental inorganic chemistry	6.2.4	S6			F
Chemical Engineering – 2	Mass transfers and exchangers	6.3.1	S6	2		F
	Processes of separation and drying	6.3.2	S6			F
Languages – 2	LV 1 – English	6.4.1	S6	4		
	LV 2 – German	6.4.2	S6			
	LV 2 – Spanish	6.4.3	S6			
	French as a foreign language	6.4.4	S6			
	Optional: 3rd language	6.4.5	S6			
Job training, Humanities	3P(2)	6.5.1	S6	4		F
	Financial aspects of a company - Business game (accountancy)	6.5.2	S6			F
	Digital tools for engineers	6.5.3	S6			F
	Sustainable development	6.5.4	S6			F/E
Industrial Internship	Industrial Internship (6 weeks)(3)	6.6.1	S6	4		F

(1): F/E: The course can be given in French or in English according to the audience
(2): Professional project, seminars, visits of industrial places
(3): 4 ECTS validated by the internship supervisor

All selected courses and projects must be discussed by your ENSCL academic supervisor upon arrival. Modifications can be done at the latest 1 month after arrival.

You must choose one Area of Study (O). Select all the courses of the Area of Study chosen. Select the languages chosen.

Teaching Units	Modules	Code	Semester	ECTS	Select your courses by ticking the boxes below	Language (1)
Organic chemistry	Heterocyclic chemistry	7.1.1	S7	6		F
	Homogeneous catalysis	7.1.2	S7			F
	Heteroelements chemistry	7.1.3	S7			F
	Applied molecular spectroscopy	7.1.4	S7			F
	Analysis methods (NMR, HPLC, GC-MS)(2)	7.1.5	S7			F
Formulation	Formulation physical chemistry	7.2.1	S7	4		F
	Polymers formulation	7.2.2	S7			F
	Design of experiments	7.2.3	S7			F/E
Materials Science	Main classes of materials	7.3.1	S7	5		F
	Mechanical analyses	7.3.2	S7			F
	Analysis of the solids	7.3.3	S7			F
	Analysis methods: (X ray fluorescence, X ray diffraction, SEM/hardness)	7.3.4	S7			F
Sustainable Chemistry	Introduction to green chemistry	7.4.1	S7	5		F
	Industrial catalysis	7.4.2	S7			F
	Heterogeneous catalysis and industrial applications	7.4.3	S7			F
	Life cycle analysis	7.4.4	S7			F
	Eco Design of materials and processes	7.4.5	S7			F
Languages	LV 1 – English	7.5.1	S7	4		
	LV 2 – German	7.5.2	S7			
	LV 2 – Spanish	7.5.3	S7			
	French as a foreign language	7.5.4	S7			

Area of study	Teaching Units	Modules	Code	Semester	ECTS	Select your courses by ticking the boxes below	Language
		Optional: 3rd language	7.5.5	S7			
	Sustainable development	Sustainable development[3]	7.6.1	S7			F
		Toxicology	7.6.2	S7	2		F
		Security[2]	7.6.3	S7			F
	Job training, Humanities	3P[4]	7.7.1	S7			F
		Problem solving tools and methodology	7.7.2	S7			F
		Industrial property	7.7.3	S7	4		F
		Numerical modeling	7.7.4	S7			F
		Literature research[5]	7.7.5	S7			F
		Written and oral communication (1st year's internship)	7.7.6	S7			F
	Chemical Engineering	Multi component distillation + liquid - liquid extraction	8.1.1	S8			F
		Aspen	8.1.2	S8	4		F
		Reactors	8.1.3	S8			F
		Experimental chemical engineering	8.1.4	S8			F
	Polymers	Physico chemistry of polymers	8.2.1	S8			F
		Polymers chemistry	8.2.2	S8	4		F
		Experimental polymers chemistry	8.2.3	S8			F
	Languages	LV 1 – English	8.5.1	S8			
		LV 2 – German	8.5.2	S8			
		LV 2 – Spanish	8.5.3	S8	4		
		French as a foreign language	8.5.4	S8			
		Optional: 3rd language	8.5.5	S8			
	Job training, Humanities	Sustainable development[3]	8.6.1	S8			F
		Cost management	8.6.2	S8			F
		Law	8.6.3	S8	5		F
		Project: "Elaboration of materials or compounds with functional aim"[4]	8.6.4	S8			F
	Internship	Industrial internship with responsibilities (8 weeks)[5]	8.7.1	S8	5		F

(1): F/E: The course can be given in French or in English according to the audience
(2): Practical work "Industrial Chemistry: analysis methods and security"
(3): Personal professional project, seminars, visits of industrial places
(4): Project: "Elaboration of materials or compounds with functional aim"
(5): 5 ECTS validated by the internship supervisor

Area of study	Teaching Units	Modules	Code	Semester	ECTS	Select your courses by ticking the boxes below	Language

Area A : Chemistry, Biomass and Environment	**Molecular and macromolecular chemistry**	Natural compounds and carbohydrate chemistry	8.3.A.1	S8	4		F/E
		Functional polymers	8.3.A.2	S8			F
		Macromolécules naturelles. Natural macro-molecules	8.3.A.3	S8			F
		Organic matter valorisation	8.3.A.4	S8			F
	Processes and bioprocesses	Recycling and treatment of industrial waste	8.4.A.1	S8	4		F
		Heterogeneous reactors	8.4.A.2	S8			F
		Introduction to microbiology	8.4.A.3	S8			F
		Catalyse enzymatique. Enzymatic catalysis	8.4.A.4	S8			F
		Principle and Concept of Biorefineries – Catalytic Transformation	8.4.A.5	S8			F
Area B : Chemical specialties and Formulation	**Chemical specialties**	Chemistry of lipids	8.3.B.1	S8	4		F
		Carbohydrate chemistry	8.3.B.2	S8			F/E
		Eco-design of surfactants	8.3.B.3	S8			F/E
		Pigments, dyes and colorimetry	8.3.B.4	S8			F/E
		Functional Polymers	8.3.B.5	S8			F/E
	Formulation design	Solvents and solubility	8.4.B.1	S8	4		F
		Formulation of surfactants and dispersed systems	8.4.B.2	S8			F
		Design of formulated products	8.4.B.3	S8			F
		Seminars (chemical specialties, Formulation	8.4.B.4	S8			F
		Experimental formulation chemistry	8.4.B.5	S8			F
Area C : Materials	**Use properties**	Corrosion	8.3.C.1	S8	3		F/E
		Physics of polymeric materials	8.3.C.2	S8			F/E
		Plasticity – Rupture	8.3.C.3	S8			F/E
	Materials	Catalytic materials	8.4.C.1	S8	5		F
		Metallurgy	8.4.C.2	S8			F/E
		Functional materials for energy	8.4.C.3	S8			F/E
		Glass -ceramics	8.4.C.4	S8			F
		Experimental metallurgy	8.4.C.5	S8			F/E

DOUBLE DEGREE STUDENT

Date: ....

SENDING INSTITUTION (We confirm that the proposed programme of study/learning agreement has been approved)

Date: ....   Date: ....

Supervisor's name and signature   Coordinator's name and signature and **Stamp**

HOST INTITUTION (We confirm that the proposed programme of study/learning agreement has been approved)

Date: ....   Date: ....

ENSCL Supervisor's name and signature   ENSCL Director of Studies - C. DUJARDIN