

MASTER 1 – ING4

2017-2018

NEW ENERGIES AND ENVIRONMENT

Program

SEMESTER 7	<ol style="list-style-type: none"> 1. Module Code ING-4S07-STA Science module for Energy Professions <ol style="list-style-type: none"> a. COURSE: ING-ENE404 Electrotechnics & Power electronics 1 b. COURSE:ING-ENE403: Physics for Energy 1 c. COURSE: ING-ENE402 : Applied Chemistry d. COURSE: ING-ENE406 : Fossil fuels : Combustion e. COURSE: ING-ENE416 : Energy Practical Work (UPMC) 1 2. Module ING-4S07-STB Technologies & methodologies <ol style="list-style-type: none"> a. COURSE:ING-PRJ411 : Project "Introduction to Embedded Systems" b. COURSE: ING-ENE411 : Ergonomics and User Experience c. COURSE: ING-ENE405 : Energy Market 3. Module Production, Distribution And Storage 1 <ol style="list-style-type: none"> a. COURSE: ING-ENE417 Smart Grids: Issues and Needs b. COURSE: ING-ENE414: Upstream / Downstream of the OIL & GAS c. COURSE: ING-ENE407 Renewable energies 1 4. Module LFH -Languages, Communication and Management <ol style="list-style-type: none"> a. COURSE: Budget management b. COURSE: Team management c. COURSE: English 7 5. Module French as foreign language <ol style="list-style-type: none"> a. COURSE: French as foreign language courses beginner b. COURSE: French as foreign language courses intermediate 6. Module PPE
SEMESTER 8	<ol style="list-style-type: none"> 1. Module Sciences, Technologies et Methodology 2 <ol style="list-style-type: none"> a. COURSE: ING-ENE409 Electrotechnics and Power Electronics 2 b. COURSE: ING-ENE429 Physics for Energy 2 c. COURSE: ING-INF404 LAMP Project d. COURSE: ING-ENE424 Energy Practical Work (UPMC)2 2. Module Energy Generation, Transport and Storage 3 <ol style="list-style-type: none"> a. COURSE: ING-ENE408 Renewable Energy 2 b. COURSE: ING-ENE413 Nuclear Energy c. COURSE: ING-ENE418 Introduction to Energy Conversion and Storage 3. Module Smart Buildings and Infrastructure 1 <ol style="list-style-type: none"> a. COURSE: ING-MAT401 Modelization and Simulation b. COURSE: ING-ENE421 Introduction to Niagara 4. Module Environment and Sustainable Development 1 <ol style="list-style-type: none"> a. COURSE: ING-ENE422 Sustainable Development 5. Module LFH-Languages, Communication and Management <ol style="list-style-type: none"> a. COURSE: ING-LFH408 Management of the individual relationship b. COURSE: ING-LFH406 Business management c. COURSE: English 8 6. Module French as foreign language <ol style="list-style-type: none"> a. French for beginners b. French for intermediate 7. Module French as foreign language <ol style="list-style-type: none"> a. COURSE: French as foreign language courses beginner b. COURSE: French as foreign language courses intermediate 8. Module PPE

SEMESTER 7

Module Code ING-4S0 7-STA Science module for Energy Professions

COURSE: ING-ENE404 Electrotechnics & Power electronics 1	Code ING-4S07-STA Science module for Energy Professions Code ING-4S07-STA	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 17	Language of instruction: English
Mode of attendance: courses		CRAMBES Christine

Prerequisites	Basics in Electrokinetics and electronics.
objectives contents	<p>Allow students to:</p> <ol style="list-style-type: none"> 1. to transform the knowledge acquired within the major in skills; 2. to make the link between theoretical notions and industrial applications. 3. be able to: <ul style="list-style-type: none"> - consider electrotechnical aspects for the design of an energy installation - to have sufficient knowledge to carry out a technological watch - Analyze needs and design a complex system; - Find / find missing information.
contents	<p>The objective is to provide students with the basic and technical knowledge that will enable them to</p> <p>To intervene in the design, construction and management of electrical systems related to energy installations.</p> <p>Knowledge in this area makes it easier to engage with Stakeholders in an energy project: energy engineering, mechanical engineering, engineering</p> <p>Climate, civil engineering,</p> <p>More specifically,</p> <ul style="list-style-type: none"> - the production, transmission, distribution, processing, transformation, management and use of energy electric, - the conversion of energy (electromechanical, electrothermal, electrochemical, lighting); - design of electrical systems (transformers, choppers, inverters); - the characteristics of the French electricity distribution network.
Skills to be learned	Know how to characterize and dimension electrical systems (transformers, choppers, inverters).
Evaluation	Exam
Bibliography	<ul style="list-style-type: none"> - « Electrotechnique et énergie électrique Notions fondamentales - Machines – Réseaux » Luc Lasne Collection: Sciences Sup, Dunod 2013 - 2ème édition EAN13 : 9782100598922 - « Exercices et problèmes d'électrotechnique Notions de base, réseaux et machines électriques » Luc Lasne Collection: Sciences Sup, Dunod 2011 - 2ème édition - EAN13 : 9782100556250 Page 353

Module Code ING-4S07-STA-Science module for Energy Professions

COURSE: ING-ENE403: Physics for Energy 1	Science module for Energy Professions Code ING-4S07-STA	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 20h	Language of instruction: English
Mode of attendance: courses	6 ects	MOUHALI Waleed

Prerequisites	Thermodynamics, Fluid mechanics, Thermal, Analysis and algebra for the equation and problem resolution.
objectives	Understand the physical processes underlying the production and distribution of all forms of energy: fossil and renewable
contents	<ul style="list-style-type: none"> - Chapter 1: Reminders of thermodynamics for thermal machines, concept of efficiency o TD 1: Heat Exchanger - Chapter 2: Solar energy and radiative transfers o TD 2: Characterization of the PV & Thermal solar field - Chapter 3: Wind and aerodynamic energy o TD3: Weibull distribution and dimensioning of a wind turbine - Chapter 4: Hydraulic and Marine Energy - Chapter 5: Introduction to Nuclear Energy
Skills to be learned	<ul style="list-style-type: none"> - Know how to size a heat exchanger; - Know how to evaluate solar PV and thermal deposits; - Know how to dimension a wind turbine.
Evaluation	Exam and report
Bibliography	Thermodynamique de l'ingénieur, O. Cleytan ; Les Eoliènes D.Le Gourrierres ; Energie Solaire J. Bernard.

Module Code ING-4S07-STA-Science module for-Energy Professions

COURSE: ING-ENE402 :Applied Chemistry	Science module for Energy Professions Code ING-4S07-STA	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 16h	Language of instruction: English
Mode of attendance: courses		ALKASM Sulaf, HAMTINE Ali

Prerequisites	Chemistry, last year of High school Level
objectives contents	To enable students to acquire the knowledge of chemistry that will enable them to understand the processes of combustion, nuclear fusion / fission, chemical depollution, electrochemical energy storage and the main transformations used in the petrochemical industry.
contents	<p>Reminder of fundamental chemistry</p> <ul style="list-style-type: none"> - Molecular structure - Nature of chemical bonds - Radioactive decay - Chemical combinations - Stoichiometry - Calculations & units <p><u>Chemical thermodynamics</u></p> <ul style="list-style-type: none"> - Heat of reaction and enthalpy variations - Entropy - Free energy function and balances - Fugacity and activity - Application to combustion <p><u>Chemical equilibrium</u></p> <ul style="list-style-type: none"> - Phase balance - Theory of solutions - Reaction equilibrium - Ion balance - Electrochemistry <p><u>Kinetic</u></p> <ul style="list-style-type: none"> - Orders of reactions - Theories of reaction rate - Mechanisms <p><u>Redox</u></p> <ul style="list-style-type: none"> - Redox reactions: file definitions - The electrochemical cell: redox potential, Nernst equation, standard potentials - Typical electrodes: electrodes of the first type, anionic electrodes, specific <p><u>electrodes</u></p> <ul style="list-style-type: none"> - Use of standard potentials - Electrolysis, Faraday's law file - Batteries: Primary and secondary batteries

	<ul style="list-style-type: none"> - Redox assays <u>Organic chemistry</u> - Structure and geometry of organic molecules - Stereoisomerism - Electronic structure of molecules <u>Reaction and reaction mechanisms</u> - Determination of structures - Nomenclature - The functions (alkanes, alkenes, alkynes, ...) - Multi-function and mixed compounds - Green Chemistry - Large classes of reactions <u>Petrochemistry</u> - Refining - Cracking - Reforming - Desulfurization
Skills to be learned	<ul style="list-style-type: none"> - To master the notions of enthalpy, entropy, free enthalpy - Know how to calculate the concentrations of species in solution (acid-base equilibria, oxydo-reduction); - Master basic analytical chemistry techniques; - Understand the reaction mechanisms (electronic effects, kinetic and thermodynamic aspects of a reaction). - To master the processes of synthesis and purification of organic compounds
Evaluation	Exam
Bibliography	Chimie générale - Tout le cours en fiches", Licence, PAES, CAPES, Alain Sevin, Françoise Brochard-Wyart, Christine Dezarnaud-Dandine, Sophie Griveau, et al. Collection: Tout le cours en fiches, Dunod, 2012 - 528 pages - 193x250 mm

Module Code ING-4S07-STA-Science module for-Energy Professions

COURSE: ING-ENE406 :Fossil fuels & combustion 1	Code ING-4S07-STA Science module for Energy Professions	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 26	Language of instruction: English
Mode of attendance: courses		BELLOT Christophe

Prerequisites	Bases of thermodynamics and chemistry.
objectives contents	The objective of this course is to enable students to: - to acquire the necessary scientific and technical knowledge on thermal power plants (gas, oil, etc.) - to have an overview of the EDF Thermal Park and the international TaF
contents	Course Map 1. Introduction - World energy situation - Place of fossil fuels 2. Combustion - Basics - Identity card of a fuel - Main reactions involved - Powers comburivore and smoke - Excess air combustion 3. Applied Thermodynamics 4. Principles of operation of a thermal power plant 5. Structure of a power generation fleet 6. The different types of flame power stations - Pulverized coal - Biomass - Combustion turbine - Combined Cycle
Skills to be learned	Being able to: - Characterize a combustion - Calculate flows of smoke, coal and cooling water - Calculate the flame stability
Evaluation	Mini project and exam
Bibliography	"La combustion industrielle", Edmond PERTHUIS, Collection Science et technique du pétrole, Editions Technip, Mai 2000.

Module Code ING-4S0 7-STA Science module for Energy Professions

COURSE: ING-ENE416 : Energy Practical Work (UPMC) 1	Code ING-4S07-STA Science module for Energy Professions	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 8	Language of instruction: English
Mode of attendance: Tutorial		Stoyan POUNKIN (Vacataire UPMC) Ali HAMTINE (Prestataire GERMINAL)

Prerequisites	N/A
objectives contents	Put into practice the skills acquired in the courses "Energy for renewable energies", "Renewable Energies" and "Combustion".
contents	Students realize, in groups of 4-5 students, the 4 Tutorials of 4h (2 in S07 and 2 in S08 to ensure the turnover on the year): 1. Combustion chamber (gas analysis, flame, heat transfer, energy balance, alternative fuel) 2. Solar Power Plant (solar collector performance and integration into a solar house project) 3. Pelton Turbine (Use of turbines in hydropower plants with fine characterization of fluid mechanics) 4. Fuel cell (Use of hydrogen as an energetic vector and characterization of the performances of a polymer cell to compare with the characteristics of solar collectors)
Skills to be learned	- To know how to characterize a combustion; - To know how to characterize a solar collector, to evaluate a PV solar field and to size a domestic PV installation; - Know how to characterize a Pelton turbine (yield, losses, producible); - To know how to characterize a Fuel Cell.
Evaluation	The tutorial mark
Bibliography	

Module Code ING-4S07-STB Technologies & methodologies

COURSE: ING-PRJ411 : Project "Introduction to Embedded Systems"	Module Technologies & methodologies ING-4S07-STB	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 29h	Language of instruction: English
Mode of attendance: courses		HOUELLE Alain, SENOUCI Benaoumeur

Prerequisites	<ul style="list-style-type: none"> - The basics of programming in C - The basics of electronics (analog, digital, architecture)
objectives contents	<p>Allow students to:</p> <ol style="list-style-type: none"> 1. Learning bases, concepts on the subject of embedded systems and sensors. 2. Identify the impact of the material on the Energy professions. 3. Be able to: <ul style="list-style-type: none"> - Team working - Manage a project from the specifications to the deliverable - Work independently - Communicating (drafting of technical document and oral presentation) - Search for missing information. - Analyze and identify key needs
contents	<p>The objective of the project is to enhance the knowledge acquired during theoretical and practical</p> <p>Realization of a multidisciplinary project related to the world of Energy (electronics, computers, sensors, Communication).</p> <ul style="list-style-type: none"> - Programming a microcontroller - Programming of an HMI interface - Communicating interface - Introduction to sensors
Skills to be learned	<ul style="list-style-type: none"> - Manage a "communicating measurement system" project from the needs analysis to the realization of a Functional prototype - Know : <ul style="list-style-type: none"> ○ Programming a microcontroller (C language) ○ Programming an HMI interface (html, css, mySQL, Javascript) ○ Set up communication between the microcontroller and the HMI ○ Set up a complete measurement chain
Evaluation	Mini Project, TP Note and Supervised Duty
Bibliography	Microcontroller Programming for Engineers, Harlan TALLEY

Module Code ING-4S07-STB Technologies & methodologies

COURSE: ING-ENE411 :Ergonomics and user experience, SOH 1 approach	Module Technologies & Methodologies ING-4S07-STB	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 15	Language of instruction: English
Mode of attendance: courses		QUERELLE Léonard

Prerequisites	NA
objectives contents	Sensitize students on the need to take human and organizational factors into account in the design of socio-technical systems.
contents	<p>Notions of Ergonomics & Human Factors</p> <ul style="list-style-type: none"> - Conduct / behavior, - Variability, - Activity, actual use - Regulation <p>Methodology & Tools</p> <ul style="list-style-type: none"> - Observation - Interview - Organization of a user test <p>Organizing a user test</p> <ul style="list-style-type: none"> - Preparation of a user test - Organization of a user test - Evaluation of a user test <p>Integration / Consideration of the Human Factor in the EPP</p> <ul style="list-style-type: none"> - Presentation of the plan of the chapter FH to be integrated into the EPP (5 pages) - Presentation in front of the group and exchange / put in perspective with the group
Skills to be learned	<ul style="list-style-type: none"> - Be able to question an expression of need and carry out a needs analysis - Know how to carry out a user test - Know how to integrate the Human Factor into a technological project
Evaluation	Project and defense
Bibliography	<p>Comprendre le travail pour le transformer : la pratique de l'Ergonomie, GUERIN François, LAVILLE Antoine, DANIELLOU François, DURAFFOURG Jacques, KERQUELEN Alain, Agence Nationale pour l'Amélioration des Conditions de Travail (15 novembre 2007)</p> <ul style="list-style-type: none"> - Ergonomie, FALZON Pierre, PUF (2004) - Ergonomie des situations informatisées : la conception centrée sur le cours d'action des utilisateurs, THEUREAU Jacques et JEFFROY François, Octarès Editions (1994) <p>Page 360</p>

Module Code ING-4S07-STB Technologies & methodologies

COURSE: ING-ENE405 : Energy Markets	Module Technologies & methodologies ING-4S07-STB	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 11	Language of instruction: English
Mode of attendance: courses		MERLE Jennifer

Prerequisites	NA
objectives contents	Allow students to understand the functioning of the Energy Markets (Oil, Gas, Electricity).
contents	<p>The Oil Market: a global market (2h)</p> <ul style="list-style-type: none"> - the resources - the demand - market: concept of equilibrium offers demand, prices and drivers of these prices (OPEC, USA, Russia, etc.), <p>Brief review of Brent's price history</p> <p>The Gas Markets (2h)</p> <ul style="list-style-type: none"> - the resources - the demand - global vision by pipelines, LNG, the shale gas revolution, Europe <p>The Coal Market (15 to 30 min)</p> <ul style="list-style-type: none"> - the resources - the demand - prices, review of price history <p>The CO2 markets (EU-ETS and other examples)</p> <p>The Market of Electricity and Basic Economics</p> <ul style="list-style-type: none"> - LCOE (Levelized Cost of Energy) / Current Energy Cost - Marginal Cost of Production - Order of Appeal and Curve of Merit Order - Functioning of electricity markets in europe (focus on the case of France) <p>The structure of energy markets in Europe</p> <ul style="list-style-type: none"> - liberalization: major steps - the functioning of the market: the major players (Commission Eu, ACER, CRE, utilities, TSOs and GRD, etc.) - the marketing of gas (long-term contracts, market places) <p>O major EU marketplaces (TTF, NBP)</p> <p>O zoom on France</p> <p>Understanding Electricity and Gas Sales Rates to Individuals</p> <ul style="list-style-type: none"> - Retail prices of electricity, construction of prices (transport costs, distribution, taxes and prices final) - Retail gas prices price construction (transport costs, distribution, tax and final price)

Skills to be learned	- Understanding the functioning of the Energy Markets - Understand price structures and prices for oil, gas and electricity
Evaluation	Mini project and exam
Bibliography	Energie : Economie & Politiques, Jean-Pierre HANSEN et Jacques PERCEBOIS, Edition De Boeck.

Module Code Production, Distribution And Storage 1

COURSE: ING-ENE417 Smart Grids: Issues and Needs	Module Production, Distribution And Storage 1 Code ING-4S07-PDS	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 18	Language of instruction: English
Mode of attendance: courses and projects		GROSSMANN Michaël, KELLER Julien

Prerequisites	NA
objectives contents	- Introduction to energy distribution and metering problems; - Presentation of Smart Grid issues
contents	Intelligent networks for counting and demand management - Introduction - Counting and Markets - Regulatory and legislative framework - Counting in France - Intelligent counting - Linky - Intelligent counting in GB - Communication Technologies - Cyber security - International panorama - Active response - Smart grid - Research Projects
Skills to be learned	- Be able to identify the needs and challenges related to the implementation of smart grids; - To be able to understand the European policy on smart metering and to compare the solutions implemented (or on) by different member countries of the EC (France, UK, Italy, Spain, Germany, etc.).
Evaluation	Mini project
Bibliography	http://www.smartgrids-cre.fr/

Module Code Production, Distribution And Storage 1

COURSE: ING-ENE414: Upstream / Downstream of the OIL & GAS	Module Production, Distribution And Storage 1 Code ING-4S07-PDS	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 24	Language of instruction: English
Mode of attendance: courses and online courses		BERNAERT Olivier, DEFLANDRE Jean-Pierre

Prerequisites	NA
objectives contents	<p>Introduce students to:</p> <ul style="list-style-type: none"> - The global context of the oil & gas sector - Exploration and production technologies - The production, storage and transport sector - The Petrochemicals sector and associated uses
contents	<p>Introduction: A Global Perspective on the Oil & Gas Sector</p> <ul style="list-style-type: none"> - The global energy landscape (evolution and mix of consumptions, reserves, world flows, etc.) - The market for energy commodities (oil and gas prices, physical and financial markets, etc.) - The players in the sector (the Oil & Gas value chain, the major upstream / downstream issues, etc.) - Introduction to Exploration / Production (role of E & P, resources, etc.) - Origins of fossil resources (principle of formation, location, characterization of oils, etc.) <p>Petroleum exploration and development strategies</p> <ul style="list-style-type: none"> - Exploration - regional assessment (basin of the oil system, modeling of the oil regions) - Exploration - seismic imaging and hydrocarbon discovery - Characterization and modeling of reservoirs (reservoir characterization, geological modeling, estimation of the volume of hydrocarbons) - Reservoir engineering (role of tank engineering, fluid description, rock characterization, Fluid behavior) - Hydrocarbon production and recovery mechanisms (production, recovery factor, primary recovery, secondary recovery, improved oil recovery, model and field of simulation) - Development strategy (reservoir simulation, main uncertainties associated with reservoir simulation) <p>Operations - From fields to petroleum products</p> <ul style="list-style-type: none"> - Drilling <p>Well Completion and Performance</p> <ul style="list-style-type: none"> - Flow insurance (from the well to the process)

	<ul style="list-style-type: none"> - Operation process (typical treatment plan, oil treatment, gas and water treatment) - Offshore Operations - Conclusion on E & P (rules of the game, actors, future challenges) - Refining process (origin and composition of crude oil, types of products and uses, Products, refining objectives, refining processes) - Gas Treatments Petrochemical & logistics - The petrochemical industry - From raw materials to intermediate products - The world of plastics - Synergy between refining, petrochemicals and the gas industry - Oil logistics: warehouses and transport of hydrocarbons - Gas logistics: transport and storage of gas
Skills to be learned	<p>After completing this course, students will be able to:</p> <ul style="list-style-type: none"> - Describe the international energy scene and the challenges facing the oil and gas industry (consumers, Producers, key players, prices, etc.); - Describe the main processes and techniques of oil and gas exploration and production (Geosciences, drilling and production), to describe their cost structures and legal framework; - Describe the main activities in refining, petrochemical and gas processing, evaluate the diversity of products and the interactions between these three industries; - Describe the specificities of the marketing and distribution of oil and gas and their products.
Evaluation	Case Study and Supervised Duty
Bibliography	<ul style="list-style-type: none"> - Our energy futur is not set in stone, Philippe CHARLEZ, Editions TECHNIP - Le Gaz Naturel : de la production aux marchés, Alexandre ROJEY, Editions TECHNIP

Module Code Production, Distribution And Storage 1

Course: ING-ENE407 Renewable energies 1	Module Production, Distribution And Storage 1 Code ING-4S07-PDS	Référent : Mr Philippe Haik
Semester: S07	No. of hours: 32	Language of instruction: English
Mode of attendance: courses and online courses		WANEQUE Jean-José

Prerequisites	Bachelor + cycle physics Thermodynamics, electronics, fluid mechanics
objectives contents	Knowledge of the functioning of different renewable energies.
contents	<p>course</p> <ul style="list-style-type: none"> - Introduction to Renewables - The Solar Resource - Photovoltaics O Photovoltaic Silicon O Photovoltaic Layer Thin - Solar Thermal Energy - Thermodynamic Solar Energy <p>TDs</p> <ul style="list-style-type: none"> - TD Session 1 - Technologies & Getting Started with Simulation Software - TD Session 2 - Case Study: Telemetry System - TD 3 - Berlin's new central station: integrated photovoltaic system <p>TPs</p> <ul style="list-style-type: none"> - TP 1 & 2 session - Use of the PVSyst software - Workshop 3 & 4 - PV test bench
Skills to be learned	<p>Calculation of the solar energy deposit for PV, Solar Thermal and Solar Thermodynamic applications</p> <ul style="list-style-type: none"> - Dimensioning of solar PV installations, solar thermal - Mastery of PVSys, PVGIS software.
Evaluation	Mini Project, TD Note, TP Note, Supervised Assignment and Defense
Bibliography	<p>The Politics and Institutions of Global Energy Governance by Thijs Van de Graaf.</p> <ul style="list-style-type: none"> - The Political Economy of Sustainable Energy by Catherine Mitchell. - Energy and the Environment by Robert A. Ristinen & Jack P. Kraushaar. - Electric Power Generation, Transmission, and Distribution, Third Edition (Electric Power Engineering Series) Hardcover edited by Leonard L. Grigsby. - Installations Photovoltaïques : conception & dimensionnement d'installations raccordées au réseau, Anne LABOURET et Michel VILLOZ, Dunod. - Les EnR pour la Production d'Electricité, Léon FRERIS et David INFIELD, Dunod.

Module Code ING-LFH – Languages, Communication and Management

ING-LFH405 - Budget management	Module: LFH ING-4S07	Référent : TURZI-TRIPODI Francesco
Semester: S07	No. of hours: 32	Language of instruction: English
Mode of attendance: Tutorial Classes		

<u>Prerequisites</u>	Knowledge of the elements provided in financial analysis and economic analysis.
objectives contents	- Ability to develop, in a simple way, the budget of a service or an SME. - In addition, students acquire the ability to locate the activity for which they can be Of the overall budget management of a large company.
contents	- Linkages between policy, strategy and budget. - Budget management: principle and methodology. - Different budgets by function, per management unit ... - Financing problems. - Budgets by responsibility centers. - Budget control and gap analysis.
Skills to be learned	To dominate the financial tools (balance sheet, profit and loss account, financial flows). Build the ratios and be able to provide an analytical look.
Evaluation	Case study (no document is allowed.) Only a so-called operational calculator Be accepted.)
Bibliography	Course materials: The LDE Handout "Budget Management"

Module Code ING-LFH – Languages, Communication and Management

ING-LFH403 – team management	Module: LFH ING-4S07	Référent : DACHER Nicolas
Semester: S07	No. of hours: 18	Language of instruction: English
Mode of attendance: Tutorial Classes	Courses	

Prerequisites	None
objectives contents	Acquire methods of team management, meeting management and conflict management.
contents	<ul style="list-style-type: none"> - Session 1: Management at Google. - Session 2: History of Management Theories and Motivation. - Session 3: The art of teamwork. - Session 4: Roles of the manager & know how to communicate effectively. - Session 5: Facilitating a productive meeting. - Session 6: Managing and preventing conflicts
Skills to be learned	To anticipate. Motivate. Organize. Give instructions and delegate. Coordinate a team. Control the work. Conduct professional interviews. Manage conflicts
Evaluation	Exam (1h30)
Bibliography	<p>Le management chez Google (documentaire France 5)</p> <ul style="list-style-type: none"> - 100 ans de management - Bruno Jarrosson, Dunod - L'avenir du management - Peter Drucker, Village mondial - L'art de la guerre - Sun Tzu, Flammarion - Les illusions du management - Jean-Pierre Le Goff, La découverte - Le principe de Peter - Jean Peter, Livre de poche - Le Manager Minute - Ken Blanchard, Eyrolles - Le chef de projet efficace - Alain Fernandez, Editions d'Organisation - Le management pour les nuls - Bob Nelson <p>Page</p>

Module Code ING-LFH – Languages, Communication and Management

ING-LFH401 : English 7	module : ING-4S07-LFH Module Langues et Formations Humaines	Referent : BINI TISSIER Kristen
Semester : 07	Hours : 11	Language of instruction: English
Mode of attendance : tutorials		

Prerequisites	English 6 or equivalent
objectives contents	<p>Fine tune linguistic abilities and develop fluency in English. (Oral and Written)</p> <p>Explore moral problems and look at ethical issues from a practical standpoint. (Learning to argue your point of view and develop concrete arguments)</p> <p>Work on presentation skills.</p> <p>Explore moral problems and look at ethical issues from a practical standpoint. (Learning to argue your point of view and develop concrete arguments)</p> <p>Work on presentation skills.</p>
contents	<p>As an engineer, your job will be to create and improve technology. But over the course of your career, you'll face not only technical challenges; you'll also encounter moral and ethical dilemmas, sometimes on a daily basis. How you resolve those dilemmas will inform your contribution to the future, for better or worse. What role will you play in shaping the future: your own future, the future of technology, the future of the planet? In this course, we will use communication techniques to develop your skills in articulating and defending your inherent values.</p> <p>Expectations: This course will focus on in-class role-play exercises, presentations, listening exercises, and debates, as well as a substantial, written case study. Class participation is essential for your success in this course, as well as your full participation in group work.</p>
Skills to be learned	Reading, writing, speaking and listening in English. Negotiation, Ethics training. Public Speaking, Argumentation and debate skills.
Evaluation	<p>NS: (coefficient 3)</p> <p>In-class activities: 60%</p> <p>Role-plays, debates, presentations, oral activities: 40%</p> <p>Quizzes, questionnaires, writing assignments: 20%</p> <p>Response and research writing assignments: 40%</p> <p>DS: (coefficient 1)</p>
Bibliography	Campus web page

4S07-FLE- French as a foreign language (FLE)

COURSE: 4S07-FLE- French as a foreign language (FLE) Beginner Level	4S07-FLE- French as a foreign language (FLE)	Référent : Mrs. Patricia Farioli
Semester: S07	No. of hours: 30	Language of instruction: English
Mode of attendance: courses		Mrs. Caroline Langer / Mr. Sylvain Lerouillois

Prerequisites	N/A
objectives contents	<p>The main objective is to give students the fundamental elements for the progressive mastery of the language to communicate adequately in the contexts of personal, social and academic life and to be comfortable in the language. It is designed to assimilate the fundamental bases of the language.</p> <p>In a general way: understanding and adapting your communication in French according to the interlocutors, the contexts and the supports, taking into account the permanent evolution of the language.</p> <p>The general objectives are based on the progression of the ability to produce and understand personal information in short exchanges. Interact in simple dialogues by establishing social contacts in the different contexts of daily life (restaurant, grocery store, cafe etc.). As well as gradually participating with autonomy in conversations and understanding simple oral and written texts.</p>
contents	<p>A1: Discovering French</p> <ul style="list-style-type: none"> - Greetings, take leave, introduce yourself - Ask and give personal information - Talk about your preferences, tastes and hobbies - Nationality / country - Say the time, give instructions, - Talk about your habits and activities
Skills to be learned	<ul style="list-style-type: none"> - Linguistic skills (lexical, semantic, grammatical, phonological, orthographic) - Sociolinguistic skills, socio-cultural and intercultural skills (politeness, knowledge of society and culture, understanding of relationships). - Pragmatic-functional skills (ability to manage and structure sentences to communicate appropriately)
Evaluation	<p>On the one hand, the evaluation is done summatively through repetitive questions / answers for an intuitive and immediate appropriation, written as well as oral, interspersed with grammatical points. On the other hand formative, through the reading and understanding of the press, authentic documents videos, films that allow them a reflection on their own learning. Cultural outings prepared upstream, then returned as written reports, are also part of the evaluation.</p>
Bibliography	<p>C., Hugot, V.M., Kizirian, M., Waendendries, A., Berthet, E., Daill. (2012). Alter Ego +. Niveau A1. Méthode de Français. Hachette Français Langue Etrangère.</p> <p>V., Petitmengin, C., Fafa (2017). La grammaire en jeux. PUG FLE.</p> <p>Ressources Internet : http://www.bonjourdefrance.com/index/indexpedago.htm http://www.ciep.fr/assistants-francais-a-letranger/ressources-pedagogiques</p>

4S07-FLE- French as a foreign language (FLE)

COURSE: 4S07-FLE- French as a foreign language (FLE) Intermediate Level	4S07-FLE- French as a foreign language (FLE)	Référent : Mrs. Patricia Farioli
Semester: S07	No. of hours: 30	Language of instruction: English
Mode of attendance: courses		Mrs. Caroline Langer / Mr. Sylvain Lerouillois

Prerequisites	A1 LEVEL of French
objectives contents	<p>The main objective of this course is to use the language in situations close to the life of the learner and to enable him/her to develop essential skills to any successful communication.</p> <p>The various activities offered are a reflection of authentic situations and thus promote learner motivation and involvement in learning French. Many opportunities are offered to interact creatively and playfully according to his/her feelings, his /her experience and his/her culture.</p> <p>The guiding thread of the course booklets corresponds rigorously to the competences described by the Common European Framework of Reference for Languages (CEFR).</p> <p>In general, the objective is to train the students to use the language more fluently and a mastered understanding in order to pass in the final year the DELF B2.</p>
contents	<ul style="list-style-type: none"> - Talk about your daily activities - Tell stories in the past - To give advice - Describe the character of a person - Express feelings - Make projects - Describe places - Express your opinions and argue
Skills to be learned	<ul style="list-style-type: none"> - Linguistic skills (lexical, semantic, grammatical, phonological, orthographic) - Sociolinguistic skills, socio-cultural and intercultural skills (politeness, knowledge of society and culture, understanding of relationships). - Pragmatic-functional skills (ability to manage and structure sentences to communicate appropriately)
Evaluation	This course is 100% validated by continuous monitoring. During the semester, several evaluations are planned. A mark for attitude and oral participation in the course is also awarded. The average of these grades is the final grade.
Bibliography	<ul style="list-style-type: none"> . Alter ego + A2, Hachette, 2012 . Communication progressive du français, Niveau intermédiaire, Clé International, 2014 . https://www.lepointdufle.net/ressources_fle/exercices_de_francais.htm . http://apprendre.tv5monde.com/fr/niveaux/a2-elementaire

ING-PRJ409: Multidisciplinary Team Project

COURSE: Multidisciplinary Team Project	ING-PRJ409: Multidisciplinary Team Project	Referent : BOUCHEZ David-Olivier
Semester: S07	No. of hours:	Language of instruction: English
Mode of attendance:		

Prerequisites	A reflection prior to the launch of the project (ideation) to convince cluster leaders of the interest in technological project with regard to socio-economic expectations.
objectives contents	On a development schedule of the PPE in agile mode (sprint weeks). In the first semester: - convince a jury of the EPP approach - define a valuation method - structure the project (specifications and functional and technical specifications).
contents	Project management in multidisciplinary team.
Skills to be learned	Soft skills / Hard skills.
Evaluation	- Pitch - Available CDC - Evaluation of the project management by the mentor
Bibliography	Literature, MOOC and course on project management + creativity and ideation.

SEMESTER 8

Module Code Sciences, Technologies et Methodology 2

ING-ENE409 : Electrotechnics & Power electronics 2	Module Sciences, Technologies & Methodology 2 ING-4S08-STM	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 14	Language of instruction: English
Mode of attendance: courses		CRAMBES Christine

Prerequisites	Basics in Electrokinetics and electronics.
objectives contents	<p>This is the continuation of the course of Electrotechnics & Electronics of Power given in S07.</p> <p>Allow students to:</p> <ol style="list-style-type: none"> 1. to transform the knowledge acquired within the major in skills; 2. to make the link between theoretical notions and industrial applications. 3. be able to: <ul style="list-style-type: none"> - consider electrotechnical aspects for the design of an energy installation - to have sufficient knowledge to carry out a technological watch - Analyze needs and design a complex system; - Find / find missing information.
contents	<p>The objective is to provide students with the basic and technical knowledge that will enable them to</p> <p>To participate in the design, construction and management of electrical systems in connection with Energy.</p> <p>Knowledge in this area makes it easier to engage with Stakeholders in an energy project: energy engineering, mechanical engineering, engineering</p> <p>Climate, civil engineering,</p> <p>More specifically,</p> <ul style="list-style-type: none"> - the production, transmission, distribution, processing, transformation, management and use of energy electric, - the conversion of energy (electromechanical, electrothermal, electrochemical, lighting); - design of electrical systems (transformers, choppers, inverters); - the characteristics of the French electricity distribution network.
Skills to be learned	Know how to characterize and dimension electrical systems (transformers, choppers, inverters).
Evaluation	Exam
Bibliography	<p>« Electrotechnique et énergie électrique Notions fondamentales - Machines – Réseaux » Luc Lasne Collection: Sciences Sup, Dunod 2013 - 2ème édition EAN13 : 9782100598922</p> <p>« Exercices et problèmes d'électrotechnique Notions de base, réseaux et machines électriques » Luc Lasne Collection: Sciences Sup, Dunod 2011 - 2ème édition - EAN13 : 9782100556250</p>

Module Code Sciences, Technologies et Methodology 2

COURSE: ING-ENE429: Physics for Energy 1	Sciences, Technologies et Methodology 2	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 20h	Language of instruction: English
Mode of attendance: courses	6 ects	MOUHALI Waleed

Prerequisites	Thermodynamics, Fluid mechanics, Thermal, Analysis and algebra for the equation and problem resolution.
objectives contents	Understand the physical processes underlying the production and distribution of all forms of energy: fossil and renewable
contents	<ul style="list-style-type: none"> - Chapter 1: Reminders of thermodynamics for thermal machines, concept of efficiency O TD 1: Heat Exchanger - Chapter 2: Solar energy and radiative transfers O TD 2: Characterization of the PV & Thermal solar field - Chapter 3: Wind and aerodynamic energy O TD3: Weibull distribution and dimensioning of a wind turbine - Chapter 4: Hydraulic and Marine Energy - Chapter 5: Introduction to Nuclear Energy
Skills to be learned	<ul style="list-style-type: none"> - Know how to size a heat exchanger; - Know how to evaluate solar PV and thermal deposits; - Know how to dimension a wind turbine.
Evaluation	Exam and report
Bibliography	Thermodynamique de l'ingénieur, O. Cleyan ; Les Eoliènes D.Le Gourrieres ; Energie Solaire J. Bernard.

Module Code Sciences, Technologies et Methodology 2

COURSE: ING-INF404 :LAMP energy project	Module Sciences, Technologies & Methodology 2 ING-4S08-STM	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 26	Language of instruction: English
Mode of attendance: courses		FALCONNET Julien

Prerequisites	Knowledge of an object-oriented programming language.
objectives contents	Master the technologies needed to create a website from a to z: HTML, CSS, JS, PHP, MySql
contents	Introduction et HTML Structure de page et CSS Interaction et Javascript Dynamisme et PHP Base de données et MySql Frameworks Model View Controller (Cakephp) Serveurs et cambouis Le site et son environnement
Skills to be learned	Being able to design and develop a website
Evaluation	Mini project , exam
Bibliography	Serveurs LAMP: administration de la plate-forme Web, Michel DUTREIX, Informatique Technique, Editions ENI.

Module Code Sciences, Technologies et Methodology 2

COURSE: ING-ENE416 : Energy Practical Work (UPMC) 1	Code ING-4S07-STA Science module for Energy Professions	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 8	Language of instruction: English
Mode of attendance: Tutorial	1 ects	Stoyan POUNKIN (Vacataire UPMC) Ali HAMTINE (Prestataire GERMINAL)

Prerequisites	N/A
objectives contents	Put into practice the skills acquired in the courses "Energy for renewable energies", "Renewable Energies" and "Combustion".
contents	Students realize, in groups of 4-5 students, the 4 Tutorials of 4h (2 in S07 and 2 in S08 to ensure the turnover on the year): 1. Combustion chamber (gas analysis, flame, heat transfer, energy balance, alternative fuel) 2. Solar Power Plant (solar collector performance and integration into a solar house project) 3. Pelton Turbine (Use of turbines in hydropower plants with fine characterization of fluid mechanics) 4. Fuel cell (Use of hydrogen as an energetic vector and characterization of the performances of a polymer cell to compare with the characteristics of solar collectors)
Skills to be learned	- To know how to characterize a combustion; - To know how to characterize a solar collector, to evaluate a PV solar field and to size a domestic PV installation; - Know how to characterize a Pelton turbine (yield, losses, producible); - To know how to characterize a Fuel Cell.
Evaluation	The tutorial mark
Bibliography	

Module Energy Generation, Transport and Storage 3

COURSE: ING-ENE408 :Renewable Energies 2	Module Production, Distribution And Storage 2 Code ING-4S08-PDS	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 32	Language of instruction: English
Mode of attendance: courses		WANEGUE Jean-José

Prerequisites	Bachelor cycle physics Thermodynamics, electronics, fluid mechanics.
objectives contents	Knowledge of the functioning of different renewable energies and, more specifically, Students: - to acquire the necessary scientific and technical knowledge on the production of electricity from a Wind power installation; - to master the design, design and operation aspects of a wind power installation. - use the GeoAnalyzer and Héliciel software
contents	course - Wind energy - Geothermal - Hydroelectricity - The Marine Energies - The biomass TDs - GeoAnalyzer GeoAnalyzer - Sizing of a wind power plant using the Héliciel software - Design of a hydroelectric installation using the Héliciel software
Skills to be learned	- Calculation of the energy deposit for geothermal, wind and hydroelectric applications. - Sizing of facilities (geothermal, wind, hydro). - Mastery of software GeoAnalyzer, Héliciel.
Evaluation	Mini project, TP note, exam and defense
Bibliography	Energie Eolienne : Principes – Etudes de cas, Marc RAPIN et Jean-Marc NOËL, Série Environnement et Sécurité, Editions DUNOD - La Biomasse énergie : Définitions, Ressources, Usages, Alain DAMIEN, Série Environnement et Sécurité, Editions DUNOD - Marine Renewable Energies, Collective Publication, Editions Quae (01/01/2009)

Module Energy Generation, Transport and Storage 3

COURSE: ING-ENE413 :Nuclear energy	Module Production, Distribution And Storage 2 Code ING-4S08-PDS	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 11	Language of instruction: English
Mode of attendance: courses		MOUHALI Waleed

Prerequisites	Bachelor cycle physics Thermodynamics, electronics, fluid mechanics.
objectives contents	Introduction to the field of nuclear production: operation of nuclear power plants, nuclear power cycle Fuel, waste management, safety and radiation protection.
contents	<ul style="list-style-type: none"> - Nuclear physics: nuclear energy (fusion, fission) - Facilities / Plant Operation - Waste - The fuel cycle - Safety and radiation protection
Skills to be learned	<ul style="list-style-type: none"> - Knowledge of the various nuclear energy production sectors; - Understand the operation of a nuclear power plant (PWR, EPR); - Control of safety and radiation protection issues in nuclear power; - Control of the fuel cycle.
Evaluation	exam
Bibliography	- Nuclear Power: A Very Short Introduction (Very Short Introductions) by Irvine, Maxwell published by OUP Oxford (2011).

Module Energy Generation, Transport and Storage 3

COURSE: ING-ENE418 :Introduction to Energy Transformation and Storage	Module Production, Distribution And Storage 3 Code ING-4S08-PDS	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 24	Language of instruction: English
Mode of attendance: courses		GAUBICHER Joël, PERTICARARI Sofia

Prerequisites	Notions of chemistry.
objectives contents	Introduction to electrochemical energy transformation and storage techniques.
contents	Introduction to electrochemical energy transformation and storage techniques. - Chapter 0: Chemical Recalls: Oxydo-Reduction & Electrochemical Cells - Chapter 1 - Storage Systems - Chapter 2 - Principles, Sizes, Electrical Answers - Chapter 3 - Batteries & Accumulators - Chapter 4 - Lithium batteries - Chapter 5 - Future Solutions
Skills to be learned	To be able to size a storage solution (choice of a technology, characterization) for an application.
Evaluation	exam
Bibliography	- Lithium Batteries and other Electrochemical Storage Systems, Christian Glaize & Sylvie Genies, Wiley-ISTE Editions, 24/07/2013.E Page

Module Smart Buildings and Infrastructure 1

COURSE: ING-MAT401 :Modeling and numerical simulation	Module Buildings and Intelligent Infrastructure1 Code ING-4S08-BII	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 26	Language of instruction: English
Mode of attendance: courses and projects		LEGRAND Laurène

Prerequisites	Mathematics (ING1-ING2 and ING3)
objectives contents	Allow students to: - Modeling physical problems with partial differential equations - Implement digital resolution strategies
contents	Introduction to fundamental models (stationary, propagative and diffusive) - Modeling of classical physical phenomena using partial differential equations - Put the corresponding mathematical problem - Numerically solve the problems of partial differential equations obtained (Matlab, Simulink)
Skills to be learned	Modeling, programming, numerical problem solving under Matlab / Simulink
Evaluation	Exam
Bibliography	- F. Filbet. Analyse numérique. Algorithme et étude mathématique. Science sup. Dunod - A. Antoniou and Wu-Sheng Lu. Practical optimization. Algorithm and Engineering applications. Springer - J.F. Sheid Graphes et Recherche Opérationnelle. Notes de cours ESIAL

Module Smart Buildings and Infrastructure 1

COURSE: ING-ENE421 :The NIAGARA platform	Code ING-4S08-BII Module Buildings and Intelligent Infrastructure 1	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 12	Language of instruction: English
Mode of attendance: courses		GUILLEMOT Thomas, LEFEBVRE Ludovic

Prerequisites	<ul style="list-style-type: none"> - Basics of programming - The basics of electronics (analog, digital, architecture)
objectives contents	<ul style="list-style-type: none"> - Introduction to building automation. - Installation, commissioning and programming of the Niagara platform.
contents	<p>Data Acquisition & Protocols</p> <ul style="list-style-type: none"> - Automation, Control & Functionality - Supervision, graphical interfaces - Associated services (development and extraction of data)
Skills to be learned	<p>Skills to be learned</p> <ul style="list-style-type: none"> - Be able to install, commission and program a GTC based on the solution Technical Niagara. - Using Niagara technology, Java programming; - Be able to design / develop user interfaces for performance monitoring (efficiency Energy, etc.)
Evaluation	Mini project
Bibliography	- http://www.tridium.com

Module Environment and Sustainable Development 1

COURSE: ING-ENE422 : Sustainable development	Module Environment & Sustainable Development 1 Code ING-4S08-EDD	Référent : Mr Philippe Haik
Semester: S08	No. of hours: 12	Language of instruction: English
Mode of attendance: courses		SCHNEIDER Valérie

Prerequisites	NA
objectives contents	Introduction to sustainable development, eco-design, life-cycle analysis (LCA) and the realization of carbon footprints.
contents	<ol style="list-style-type: none"> 1. Introduction to Sustainable Development <ul style="list-style-type: none"> - Context & Issues: Links between economic development and major environmental issues Their social repercussions. - Presentation of public principles and policies leading to sustainable economic development. - Presentation of different green management strategies and practices. 2. Lifecycle Analysis 3. Introduction to the calculation of the Carbon Balance 4. The Green IT
Skills to be learned	<ul style="list-style-type: none"> - Be able to analyze a corporate CSR policy. - Be in a position to implement an approach to accounting for greenhouse gas emissions (carbon footprint) ; - Be able to carry out a life cycle analysis.
Evaluation	exam
Bibliography	Dion, Michel, Dominique Wolff et al. (2008) « Le développement durable : Théories et applications au management », Dunod, 246 p.

Module Code ING-LFH – Languages, Communication and Management

ING-LFH408 : Management of the individual relationship	Module: LFH ING-4S08	Référent : DACHER Nicolas
Semester: S08	No. of hours: 13	Language of instruction: English
Mode of attendance: Tutorial Classes		

Prerequisites	N/A
objectives contents	Acquire methods of team management, meeting management and conflict management
contents	- Session 1: Introduction and tests. - Session 2: Analysis tools (introduction to NLP. - Session 3: Transactional Analysis / Evaluation.
Skills to be learned	Identify intellectual, personal and professional profiles. Practice the basics of NLP and transactional analysis.
Evaluation	1h30 test
Bibliography	

Module Code ING-LFH – Languages, Communication and Management

ING-LFH406: Business Management	ING-4S08	Référent : TURZI-TRIPODI Francesco
Semester: S08	No. of hours: 24	Language of instruction: English
Mode of attendance: Tutorial Classes	Courses	

Prerequisites	None, this module is specific for students who have no management training.
objectives contents	Encourage them to deepen for themselves all these new notions for them so that they do not "lose foot" in the "Budget Management" module.
contents	A summary (modules treated with ING2 and ING3) is made as follows: - 6 hours for the module "Manage, it's simple ..." - 6 hours for the "Financial Analysis" module - 6 hours for the module "Economic Analysis"
Skills to be learned	Know how to pilot and follow the management tools of a company
Evaluation	Realize a file
Bibliography	

Module Code ING-LFH – Languages, Communication and Management

ING-LFH401 : English 8	module : ING-4S08-LFH Module Langues et Formations Humaines	Referent : BINI TISSIER Kristen
Semester : 08	Hours : 11	Language of instruction: English
Mode of attendance : tutorials		

Prerequisites	English 7
objectives contents	<p>Fine tune linguistic abilities and develop fluency in English. (Oral and Written)</p> <p>Explore moral problems and look at ethical issues from a practical standpoint. (Learning to argue your point of view and develop concrete arguments)</p> <p>Work on presentation skills.</p> <p>Explore moral problems and look at ethical issues from a practical standpoint. (Learning to argue your point of view and develop concrete arguments)</p> <p>Work on presentation skills.</p>
contents	<p>What will the world be like 30 years from now? What will your life be like? What role will you play in shaping this future? As an engineer, your job will be to create and improve technology. Over the course of your career you'll face not only technical challenges; you'll also encounter moral and ethical dilemmas. How you resolve those dilemmas will inform your contribution to the future, for better or worse. In this course we will work in the intersection of science fiction and ethics in order to imagine possible futures—and your part in building the kind of world you want to live in, and to pass on to your children.</p> <p>This course will focus on group and solo presentations, listening exercises, debates, and role plays.</p>
Skills to be learned	<p>Reading, writing, speaking and listening in English. Negotiation, Ethics training. Public Speaking, Argumentation and debate skills.</p>
Evaluation	<p>NS: (coefficient 3)</p> <p>Student-led lesson 50%</p> <p>Written work (quizzes, listening comprehension, etc.): 20%</p> <p>Class participation: 30%</p> <p>DS: (coefficient 1)</p>
Bibliography	Campus course page

4S08-FLE- French as a foreign language (FLE)

COURSE: 4S08-FLE- French as a foreign language (FLE) Beginner Level	4S08-FLE- French as a foreign language (FLE)	Référent : Mrs. Patricia Farioli
Semester: S08	No. of hours: 30	Language of instruction: English
Mode of attendance: courses		Mrs. Caroline Langer / Mr. Sylvain Lerouillois

Prerequisites	N/A
objectives contents	<p>The main objective is to give students the fundamental elements for the progressive mastery of the language to communicate adequately in the contexts of personal, social and academic life and to be comfortable in the language. It is designed to assimilate the fundamental bases of the language.</p> <p>In a general way: understanding and adapting your communication in French according to the interlocutors, the contexts and the supports, taking into account the permanent evolution of the language.</p> <p>The general objectives are based on the progression of the ability to produce and understand personal information in short exchanges. Interact in simple dialogues by establishing social contacts in the different contexts of daily life (restaurant, grocery store, cafe etc.). As well as gradually participating with autonomy in conversations and understanding simple oral and written texts.</p>
contents	<p>A1: Discovering French</p> <ul style="list-style-type: none"> - Greetings, take leave, introduce yourself - Ask and give personal information - Talk about your preferences, tastes and hobbies - Nationality / country - Say the time, give instructions, - Talk about your habits and activities
Skills to be learned	<ul style="list-style-type: none"> - Linguistic skills (lexical, semantic, grammatical, phonological, orthographic) - Sociolinguistic skills, socio-cultural and intercultural skills (politeness, knowledge of society and culture, understanding of relationships). - Pragmatic-functional skills (ability to manage and structure sentences to communicate appropriately)
Evaluation	<p>On the one hand, the evaluation is done summatively through repetitive questions / answers for an intuitive and immediate appropriation, written as well as oral, interspersed with grammatical points. On the other hand formative, through the reading and understanding of the press, authentic documents videos, films that allow them a reflection on their own learning. Cultural outings prepared upstream, then returned as written reports, are also part of the evaluation.</p>
Bibliography	<p>C., Hugot, V.M., Kizirian, M., Waendendries, A., Berthet, E., Daill. (2012). Alter Ego +. Niveau A1. Méthode de Français. Hachette Français Langue Etrangère.</p> <p>V., Petitmengin, C., Fafa (2017). La grammaire en jeux. PUG FLE.</p> <p>Ressources Internet : http://www.bonjourdefrance.com/index/indexpedago.htm http://www.ciep.fr/assistants-francais-a-letranger/ressources-pedagogiques</p>

4S08-FLE- French as a foreign language (FLE)

COURSE: 4S08-FLE- French as a foreign language (FLE) Intermediate Level	4S08-FLE- French as a foreign language (FLE)	Référent : Mrs. Patricia Farioli
Semester: S08	No. of hours: 30	Language of instruction: English
Mode of attendance: courses		Mrs. Caroline Langer / Mr. Sylvain Lerouillois

Prerequisites	A1 LEVEL of French
objectives contents	<p>The main objective of this course is to use the language in situations close to the life of the learner and to enable him/her to develop essential skills to any successful communication.</p> <p>The various activities offered are a reflection of authentic situations and thus promote learner motivation and involvement in learning French. Many opportunities are offered to interact creatively and playfully according to his/her feelings, his /her experience and his/her culture.</p> <p>The guiding thread of the course booklets corresponds rigorously to the competences described by the Common European Framework of Reference for Languages (CEFR).</p> <p>In general, the objective is to train the students to use the language more fluently and a mastered understanding in order to pass in the final year the DELF B2.</p>
contents	<ul style="list-style-type: none"> - Talk about your daily activities - Tell stories in the past - To give advice - Describe the character of a person - Express feelings - Make projects - Describe places - Express your opinions and argue
Skills to be learned	<ul style="list-style-type: none"> - Linguistic skills (lexical, semantic, grammatical, phonological, orthographic) - Sociolinguistic skills, socio-cultural and intercultural skills (politeness, knowledge of society and culture, understanding of relationships). - Pragmatic-functional skills (ability to manage and structure sentences to communicate appropriately)
Evaluation	This course is 100% validated by continuous monitoring. During the semester, several evaluations are planned. A mark for attitude and oral participation in the course is also awarded. The average of these grades is the final grade.
Bibliography	<ul style="list-style-type: none"> . Alter ego + A2, Hachette, 2012 . Communication progressive du français, Niveau intermédiaire, Clé International, 2014 . https://www.lepointdufle.net/ressources_fle/exercices_de_francais.htm . http://apprendre.tv5monde.com/fr/niveaux/a2-elementaire

ING-PRJ410 : Projet Pluridisciplinaire en Equipe 2

COURSE: Multidisciplinary Team Project	ING-PRJ410 : Projet Pluridisciplinaire en Equipe 2	Referent : BOUCHEZ David-Olivier
Semester: S08	No. of hours:	Language of instruction: English
Mode of attendance:		

Prerequisites	Master the project management team.
objectives contents	On a development schedule of the PPE in agile mode (weeks of sprints): In the second semester, realize a functional technical prototype and expose the valuation arguments.
contents	Develop a project in a multidisciplinary team to produce a functional technical prototype and expose its added value.
Skills to be learned	Soft skills / Hard skills
Evaluation	<ul style="list-style-type: none"> - Livrable Specs - Evaluation de la gestion de projet par le mentor - Soutenance finale
Bibliography	Literature, MOOC and course on project management + creativity and ideation.