Double Degree exchange programs taught at Phelma for KTH students

Double Degree program for KTH students:
In-coming Double Degree KTH students are registered in KTH and in Phelma, but they do not pay registration fees in Phelma, except some very low cost which cannot be waved, and, for non-European students, the French Health Insurance.
They take part in Phelma academic engineering program like regular students and should meet the same requirements to obtain the “diplôme d’ingénieur”, like:

- General average over or equal 12/20,
- B2 in CECR level in English language at the end of the program.

When returning to Sweden, KTH students obtain the “Civilingenjör”

Academic calendar:

- Fall semester (early Sept. to end of January)
- Spring semester (early Feb. to end of June)

Credit system:
Students get 60 ECTS per year (30 ECTS per semester).

Academic program specifications:
As a French “Grande Ecole” in Engineering, Phelma academic organization includes:

- many different short courses,
- lots of practical works in small groups supervised by a professor in specific rooms (labs).

Phelma offers courses from the last year of Bachelor to last year of Master (see below “Information on our education system”), i.e. 3 years curriculum. Last year of Bachelor (⇔ to the 1st year in Phelma) is devoted to more general academic content, whereas the two years at Master level (⇔ to the 2nd and 3rd year in Phelma) offer different specializations in engineering. Most of the time, Double Degree students are admitted in the equivalent of the master level.

Information on our education system:
Phelma is a French "Grande Ecole" dedicated to Engineering studies. You will find below the regular curriculum for our students.
After 7 years of secondary studies, French students obtain the "Baccalauréat général" in Science, Literature or Economics. To be admitted in a "Grande Ecole" such as Phelma, students pass different steps:

- Step 1. Be admitted in "preparatory classes" after their "Baccalauréat général" in Science. Only the top 10% students in Science are admitted. These "preparatory classes" last for 2 years, where students study very intensively maths, physics and chemistry.
- Step 2. After 2 years of "preparatory classes", students have of take a national competition to enter a "Grande Ecole" such as Phelma.
- Step 3. If they succeed to enter in Phelma, they stay 3 years there to obtain the French "diplôme d'ingénieur national", which allow PhD admission (<=> Master of Science).

Double degree programs
opened to KTH students
Diplôme d'ingénieur / Civilingenjör

	Language of courses	Recommended French level	Overview and career opportunities	Internet link
Bio Engineering				
Biomedical Engineering	**English**	**None**	In this Specialty, students will be trained both in applied science and instrumentation technology. Skills in instrumentation design, numerical simulation and practical testing will be developed. In the Instrumentation and Microsystems' elective module, emphasis will be put on microelectronic applications and microsystem engineering. In the Biotechnology' elective module, a basic theoretical and practical knowledge of molecular and cellular biology will be provided. Students will thus be prepared to work in multidisciplinary teams. Domains involved The design of instrumentation systems in physics and biotechnology: - Microsystems: design and production techniques - Microelectronics: design and production techniques - Measurement and imaging systems Areas of application: - Sensors / actuators - Medical imaging and radiotherapy - Nuclear instrumentation - Diagnostics and biotechnology - Medical instrumentation Engineers will work in industrial or academic research departments, for varied applications, from microelectronics to radiotherapy, car electronics to in vitro diagnosis. This program can also serve as a basis for a subsequent specialization in sales, marketing and management.	http://phelma.grenoble-inp.fr/engineering-degree/degree-biomedical-engineering-240319.kjsp?RH=1246290553973

	Language of courses	Recommended French level	Overview and career opportunities	Internet link
Materials				
Materials Science and Engineering	**English or French, depend-ing on the student choice**	**None, for student coming for the program taught in English.** **B1 in CECR level is recommended for students coming for the program taught in French.**	In the domains associated with this Specialization program, students will acquire the skills necessary for forming, shaping and combining materials (metals, ceramics, polymers, composites), and for understanding the relationships between material microstructure and their physical, physicochemical and mechanical properties and to analyze the materials lifecycle and degradation process. Through several projects they will acquire materials characterization skills on the macro, meso and nano levels and the ability to model phenomena and microstructures at the appropriate level for the materials and problems concerned. Students will be able to design and manufacture new materials in the context of sustainable development so as to respond to contemporary industrial and social requirements. This program trains engineers to be competent in the areas of physical chemistry, mechanics and physical modeling allowing them to fill the following roles: Materials scientist, project manager, engineering consultant and engineer for production, R&D, products or quality. In the following sectors: Transport (automobile industry, avionics, trains, etc.), electrical and nuclear energy, materials and metallurgy (polymers, ceramics, composites and metals), microelectronics, surface treatment and coatings.	http://phelma.grenoble-inp.fr/engineering-degree/materials-science-and-engineering-240263.kjsp?RH=1246290553973
Energy				
Reactor Physics and Nuclear Engineering	**French**	**B1 in CECR level is recommended**	Engineers graduating with this program are most often employed in the following positions: - Research and development engineer in the nuclear power industry - Project manager in said industry - Operations engineer in energy production centers - Safety engineer in institutions dealing with nuclear safety - Researcher in an academic laboratory - Engineer for the decommissioning of nuclear plants	http://phelma.grenoble-inp.fr/studies/reactor-physics-and-nuclear-engineering-specialty-509942.kjsp

	Language of courses	Recommended French level	Overview and career opportunities	Internet link
Physics & nanotechnology				
Physics and Nanoscience	**French**	**B1 in CECR level is recommended**	The objective of the Physics and Nanoscience Specialization is to train engineers and researchers with a high level of expertise in physics and nanotechnology. Such engineers are in high demand in industrial research and development departments in the fields of microelectronics, optical devices and telecommunications and also in public research laboratories (such as CNRS, CEA and universities) for applied physics and theoretical physics.	http://phelma.grenoble-inp.fr/engineering-degree/physics-and-nanoscience-pns--247688.kjsp?RH=1246290553973
Information and Communication				
Integrated Electronic Systems	**French**	**B1 in CECR level is recommended**	The objective of the training program is to acquire a strongly specialized expertise in the design and experimentation of last generation micro and nanoelectronics, the most up-to-date embedded chips or optoelectronic circuits and systems. A complementary objective is to address specification, design and validation of complex system-on-chip architecture solutions for a wide range of applications. Students are trained in applied research and development of integrated circuits in analog, digital design, system-on-chip, optoelectronics, microwaves, RF.	http://phelma.grenoble-inp.fr/engineering-degree/integrated-electronic-systems-sei--240377.kjsp?RH=1246290553973
Signal and Image Processing, Communication Systems, Multimedia	**French**	**B1 in CECR level is recommended**	The demand for engineers in this field is increasing due to the fact that signal and image processing, communication and multimedia technologies are heavily involved in many industrial sectors, such as information industries, telecommunications, the biomedical sector and the leisure industry. The objective of this Specialization is the training of high level engineers with expertise in signal processing, computers and electronics, capable of developing industrial projects in the relevant sectors.	http://phelma.grenoble-inp.fr/engineering-degree/signal-and-image-processing-communication-systems-multimedia-240367.kjsp?RH=1246290553973

	Language of courses	Recommended French level	Overview and career opportunities	Internet link
Environment				
Electrochemistry and Processes for Energy and the Environment	**French**	**B1 in CECR level is recommended**	This Specialization program develops skills based in the domains of electrochemistry, physical chemistry and process engineering. Graduating students will be able to : - Design and model traditional processes and eco-processes - Establish a process of development, synthesis or recycling - Develop and optimize new materials and electrochemical generator systems - Introduce bioprocesses and biosensors into production - Promote multi-scale approaches - Analyze and characterize a material or product - Understand and predict corrosion - Manage industrial hazards - Introduce sustainable development (eco-design, life cycle analysis, etc.) Career Opportunities - Production, operations, maintenance, trials, quality, safety - Engineering, design and consulting - Research and development - Customer relations (marketing, sales) - Public education and research - Information systems - Project Management Employment Sectors - Transport : automobile industry, avionics, trains - Energy : renewable energy (generators and electrochemical storage), nuclear energy - Chemistry, electrochemistry, pharmaceuticals, petroleum industry, metallurgy - Microelectronics, surface treatments and coatings - Water, recycling and waste management - Service industry: engineering, computers, business	http://phelma.grenoble-inp.fr/engineering-degree/electrochemistry-and-processes-for-energy-and-the-environment-epee--240252.kjsp?RH=1246290553973