

TRAINING PROGRAM

CEMAM ensures a close collaboration between academic research, applied industrial research and student training. This approach allows trainees (Master-level students, PhDs and Post-Doctoral associates) to interact with researchers and engineers through numerous fundamental and applied long-term projects. CEMAM training also relies on several international programs dedicated to materials science : four international master programs and one international doctoral school.

CEMAM supports that “tailored materials”-based solutions can address most of the rising challenges in energy issues, sustainable development, nanotechnology advances,... In that purpose, a new generation of material engineers and researchers has to be trained to this innovative approach. We believe that a very efficient way to prepare highly-qualified engineers and researchers relies on a deep immersion of trainees within state-of-the-art projects. This point is at the heart of our “project-based” pedagogy that involves both academic and industrial researchers. As such, the strong tradition of industrial collaboration and research training of engineers characterizing Grenoble-INP is a key asset in the spreading of these ideas both in the academic and in the industrial R&D community.

The CEMAM community is very active to provide a highly interdisciplinary environment to master students, PhDs and post-doctoral associates through numerous bodies : two engineering schools (Phelma and Polytech-Grenoble), four international masters (FAME, MN², MaNuEn and EMINE), the doctoral school IMEP² and the International Erasmus Mundus doctoral school in Functional Materials (IDS-FunMat).

ENGINEER DEGREE COURSES, INTERNATIONAL MASTERS AND DOCTORAL SCHOOL.

Phelma proposes several engineer or master

degree courses in close relation with CEMAM topics:

- «Materials Science and Engineering» degree, addressing the relation between microstructures, properties and functions.
- «Electrochemistry and Processes for Energy and the Environment» degree, at the interface between physics and chemistry.
- «Systems and Microsystems for Physics and Biotechnology» degree, focused on the instrumentation and material design for biomedical applications.
- «Physics and Nanoscience» degree, that addresses physics and technologies at small scales.

Four international master programs are associated to these engineer degree courses :

- «FAME» master, focused on functional materials
- «MN²» master, a joint master with Grenoble-UJF on Nanosciences and Nanotechnologies.
- «MaNuEn» and «EMINE» masters, dedicated to material science for nuclear engineering.



Combining long term competence
 with short notice reactivity

All these courses are briefly described there. They are built up on a good balance between lectures and long-term projects on topics proposed by industrial partners (thus maintaining this strong coupling between academic and industrial research). Few project examples : “Material and process selection”, “Modeling and simulations at small scales”, “Lab projects”, “Failure analysis”, “Reverse engineering projects”,... Specific courses on architected materials are also proposed to PhDs by the doctoral school IMEP², in partnership with the University of Lyon.

For more details :

<http://phelma.grenoble-inp.fr>

<http://www.polytech-grenoble.fr>

CONTINUING EDUCATION DEPARTMENT.

This side of training is also greatly developed in Grenoble-INP. Thanks to its privileged relation with private companies, about 20 formations of the department are “Materials and Process”-related. This department has also recently set up a new diploma (called DHET, for “Diplôme des Hautes Etudes Technologiques”) that may be obtained by private technical staff (or by visiting students) after completion of the requirements set for the second year of Phelma’s Master programs.

For more details :

<http://formation-continue.grenoble-inp.fr>

SUMMER SCHOOL ON “ARCHITECTURED MATERIALS AND MATERIAL BY DESIGN”.

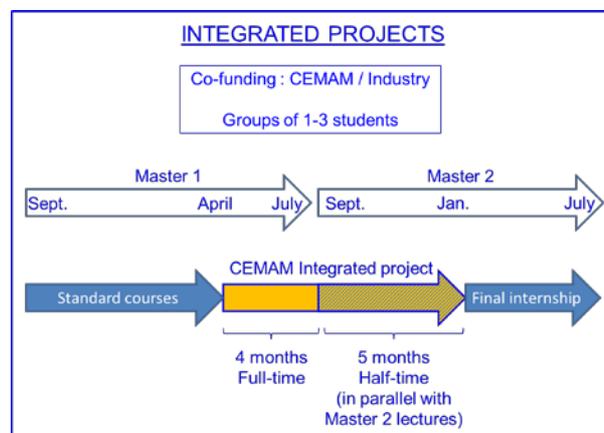
This summer school has been set up on a tri-annual basis (2011, 2014,...). It comprises basic courses on the different classes of materials, advanced courses on

multiscale modeling, on interface mechanics, on functional properties, and a series of seminars on examples of multifunctional architected materials, given both by academics and by industrial researchers.

INTEGRATED PROJECTS.

These projects are run by teams of 1-3 students (master-level and/or DHET trainees) and supervised by both an industrial and an academic supervisors. The project topics are proposed by the industrial partner that wants either to develop a prototype product, or to assess an innovative solution to a specific issue, or to optimize a set up dedicated to a multifunctional technical requirements,... Projects are co-funded by CEMAM and the industrial partner.

Projects last from April to January : 4-months in full-time (equivalent to the 2nd year french internship) followed by 5-months in half-time (the other half-time being dedicated to lectures).



OTHER INTERNATIONAL AGREEMENTS.

Other long-lasting collaborations are also still running in parallel to these programs. Some of the major involved universities : McMaster University (Canada), University of Santa Barbara (US), Université catholique de Louvain la neuve (Belgium), Jiaotong University (Shanghai-China), Institute of Materials Research (Shenyang-China).



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