The emergence of the sustainable development concept has considerably tightened the criteria that materials and processes should satisfy, in terms of energy and commodity consumption, in addition to strength and durability. Materials should be thermally insulating, light, easily workable and recyclable in environmentally friendly processes. Even if in the last few years many progresses have been made, many problems remain to be solved. The only way to meet these new challenges is to combine multidisciplinary approaches in engineering, as scientific, technical and industrial challenges should be successfully tackled.

Objective

The SMCD Master’s program provides the necessary scientific bases in Materials Science, Physics, Mechanics, Chemistry, and Numerical Simulation for appropriate multiscale and multidisciplinary approaches in materials and engineering, with the optimisation of their production, their properties in use and their durability under defined environmental conditions. Thematic courses are given, which involve various scientific fields, and some directly address environmental and energy issues. Students are prepared to careers in research and development departments in leading companies and in materials science laboratories.

SMCD Master's Benefits

- Multidisciplinarity combining Physics, Chemistry, Mechanics and Applied Mathematics
- Openness to environmental concerns, environmental impact of materials
- Taking into account the environmental impact of materials
- A pedagogical team of high-level scientists
- Direct interaction with industrial and academic research
- Personalised monitoring
Master of Science
Materials Science for Sustainable Construction (SMCD)

Contents

Interdisciplinary courses:
• Physical Chemistry of Building Materials
• Multiscale experimental characterization tools
• Sustainable Construction
• Rheophysics and Soft Matter - Complex Fluids
• Mechanics and Physics of Porous Solids
• Upscaling Methods
• Molecular Simulation
• Mixing and Granular Materials

Research Internship in an academic or an industrial laboratory.

Knowledge / Skills

• Physical chemistry of materials
• Cement process chemistry
• Material behaviour modelling
• Process modelling
• Theoretical and experimental approaches to the material properties
• Numerical methods
• Life-cycle assessment

CALENDAR
Application deadline: June 30.
Courses from the end of September until the end of February.
Research internship from the beginning of March.

VALIDATION
216 hours of course work and a Research Internship.

LOCATION
École des Ponts ParisTech

COST OF STUDY (2011)
700€ (Registration fees, Tuition fees, health insurance and complementary health insurance cost).

FINANCIAL SUPPORT
Scholarship can be obtained from industrial chairs supporting the Master Program.
See Website

Testimonial
"The Master 'Materials Science for Sustainable Construction' gave me a basic language in different fields which are linked to the research of hydraulic binders and materials science. This was essential for my work in inventive design, which requires experts from different fields to work together. I also appreciated the 'research' culture, both in the professors way of teaching and the opportunities given to students to go into subjects in more detail, either on their own or in groups."

Céline Conardy - SMCD Masters 2007

Job opportunities
The SMCD Master’s Program offers students the prospect of a career in the research and innovation professions. Extended studies in the form of a PhD thesis are recommended.

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