

MECHANICAL ENERGY MATERIALS

ED 409

SUPPORT INSTITUTION: Institut National Polytechnique de Lorraine – INPL Nancy

CO-AUTHORIZED INSTITUTION(S): Université Henri Poincaré Nancy 1, Université Paul Verlaine Metz, Supelec

SCIENTIFIC INTEREST

- Material elaboration process engineering, basic methods, reactors, modelling-simulation-control; industrial energetics, casting and solidification; production of metastable structures.
- Physical Chemistry for Engineers, Materials for Industry.
- Complex fluids, polymers, divided solids
- Complementary training: Industrial systems engineering; project management, technological systems management, production and quality management.
- Fluids mechanics, thermal studies, ionised media; energetics; transfer phenomena in turbulent flows; complex and biphasic fluids; coupled transfers in heterogeneous media; M.H.D.; plasmas; digital modelling of flows.
- Hydrodynamics and thermal studies of porous media.
- Optoelectronics
- Solids and materials mechanics; thermorheology and behavioural modelling; structure calculation; thermo physical properties.
- Surfaces and interfaces; mechanical, physical, chemical properties; thermal and thermomechanical treatments, surface treatment; application to microsystems technology.
- Phase properties, transformations and transitions; structural phase transformations; mechanics of the rupture of different materials; mechanical properties of metastable systems; grain growth in polycrystalline structures.
- Physical metallurgy: solid physics and chemistry; new materials, structure-property relationships
- Mechatronics, robotics, computer assisted production management.

RESEARCH UNITS

<http://www.campusfrance.org/ecoledoc>
>search by region>institutions
>doctoral departments>research units

ADMISSION REQUIREMENTS

- **Degree or level required**
Masters degree or equivalent (with a Research training).
- **Languages proficiency**
French: good
English: good
- **Admission procedure(financement, sélection...)** :
 - Detailed curriculum vitae
 - Equivalence of the foreign diploma, validated by the thesis adviser, the scientific director and the director of the doctoral department
 - List of diplomas (with comments) and transcript (marks sheet)
 - Funding (about 1000 euros/month for 3 years)
 - Covering letter about the research proposal
 - Introducing letter (written by the director of the Masters program)
 - Thesis proposal approved by the thesis adviser
 The research training is a key point for the admission in the Doctoral program.
- **Admission information :**
DOCTORAL PROGRAM : www.emma.inpl-nancy.fr/

WEBSITE IN ENGLISH

<http://www.emma.uhp-nancy.fr/php/index.php?p=index>

Number of students in the doctoral program	282
Number or % of foreign students	137 = 48,58 % of foreign students
English courses/Courses taught in English	• "Auto-learning of English" • "How to publish a scientific paper". See http://e-doct.inpl-nancy.fr/
Network of French institutions	- PRES – Research and Higher Education Cluster : Nancy Université - www.nancy-universite.fr - CRED Lorraine (Comité Régional des Ecoles Doctorales de Lorraine) - www.doctoriales.cies-lorraine.net - Plateau Lorrain de Professionnalisation des Docteurs - http://e-doct.inpl-nancy.fr/
International thesis co-directed	42 = Algeria 5 ; Belgium 1 ; Canada 1 ; China 9 ; Germany 5 ; Hungary 1 ; Iran 1 ; Italy 2 ; Moldavia 1 ; Poland 1 ; Romania 6 ; Russia 2 ; Spain 1 ; Togo 1 ; Tunisia 3 ; Ukraine 2
Network of international institutions	• Doktorandenkollegien "Statistical Physics of Complex Systems" <i>Collège Doctoral</i> • Franco-Chinese <i>Collège doctoral</i> • Franco-Japanese <i>Collège doctoral</i>
Financial support	RESEARCH GRANTS (3 YEARS) 84, including 32 for foreign students Sources of funding • Industrial contracts CIFRE • Ministry of Foreign Affairs and specific grants for foreign students • French Regional funds
Welcome services	Housing • CROUS de Nancy-Metz - Centre Régional des œuvres Universitaires et Scolaires www.crous-nancy-metz.fr • Welcoming foreign students : Pôle Universitaire Européen de Lorraine www.europole.u-nancy.fr - acc.nancy@europole.u-nancy.fr