



# INTERNATIONAL SEMESTER

MATERIALS AND SURFACE TREATMENTS ENGINEERING at the University of Limoges, FRANCE



Through exclusive training in Surface Coating and Treatments, you will master conventional and innovative processes so that you may adapt the properties of the surface of materials and parts optimally to their utilization, while respecting the environment.

Desired skills: Strategic industrial sectors such as automobile, aeronautics and aerospace, electronics, medical, energy, metallurgy and surface treatment or the environment.

This international semester takes place in Ester Technopole, a unique place in Europe for ceramic materials.

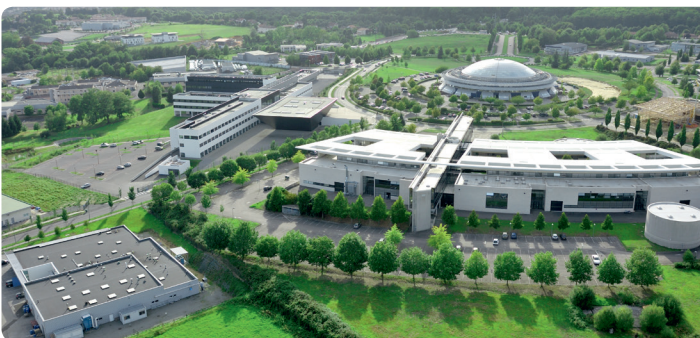
## TRAINING INSTITUTIONS

- ENSIL-ENSCI (National Higher Engineering College)
- The Faculty of Sciences and Technologies

## RESEARCH LABORATORY

IRCER, Institute of Research for Ceramics, laboratory internationally recognized for Ceramics and Surface Treatments Processes

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Parc ESTER Technopole, a unique place in Europe for Ceramic Materials

## OPENING DOORS TO THE WORLD...

It is indispensable today for students to be open to other cultures, other ways of living and working.



### LIMOGES

Close to the center of France, 160 000 inhabitants

By plane: one hour from Paris,  
one hour and a half from London

By train or by car 3 hours from:  
Paris, Toulouse, Bordeaux, Atlantic ocean...

## MORE ABOUT THE INTERNATIONAL SEMESTER...

**WHO IS CONCERNED?** International students for their various curricular part of european (ERASMUS) and international exchange programmes.

**WHEN DOES THE PROGRAM TAKE PLACE?** Spring semester, 1st February-31st May (15 weeks of classes)

**ENGLISH IS THE COMMON LANGUAGE USED IN EVERY COURSE**

**ADMISSION FEE:** 900€ (Erasmus students and some of our partners are exempt from these costs) The real cost of the semester is 7500€ but the complementary cost is supported by the French government.

**THREE MAIN PURPOSES DEFINE THE PROGRAM CONTENT (30 ECTS)**

- Acquire and develop key skills and knowledge in the field of Materials and Surface Treatments
- Acquire a practical experience regarding high-tech deposition processes and characterization methods thanks to practical works and a personal technical project suggested by industrial partners and then refined with the teaching team
- Benefit from an international experience, initiation to french language and culture

# TRAINING

20h a week + technical project ECTS

		ECTS
GENERAL TOPICS*	Initiation to French language and discovery of French culture Surface engineering and applications: overview Industrial ecology : sustainability and recycling Project Management/Test plan management	5
	Metallurgy and corrosion	7
SURFACE TREATMENT	Wet surface treatments Introduction Surface preparation Anodizing Electroplating, Electroless plating Plating design regarding product functionalities	
	Dry surface treatments Physical Vapour Deposition (PVD) Chemical Vapour Deposition (CVD/PECVD) Thermal spraying	
	Special process management	
Lectures by professionals and visits of surface treatment plants		
Practical work	3	
PROPERTIES OF USE AND CHARACTERIZATION*	Film properties Thermal properties Mechanical properties Optoelectronic properties	6
	Surface, microstructural and chemical characterization Electron Microscopy Diffraction Vibrational spectroscopy Surface characterization	
	Practical work	3
TECHNICAL PROJECT*		6

\* Common units with the semester Industrial Ceramics and processing

## INTERNATIONAL STUDENTS OFFICE

Supports international students with: accommodation, administrative formalities (opening a bank account...), transport information, health insurance plans, discovering Limoges and its region

Administrative contact : Mrs Frédérique LUNEAU and Mrs Isabelle VIEVILLE international.ingenieur@unilim.fr

TO GET MORE INFORMATION

[www.ensil-ensci.unilim.fr](http://www.ensil-ensci.unilim.fr)  
[www.unilim.fr](http://www.unilim.fr)

EDUCATIONAL CONTACT

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