

AEROMAT • INNOVATION AEROSPACE MATERIALS DESIGN, MANUFACTURING & INNOVATION MANAGEMENT MASTER OF SCIENCE

ACCREDITATION

Accredited by the French Ministry of Higher Education and Research. Decree 20151031, 2015, July 10.

KEY WORDS

Materials, Mechanical Engineering, Processing, Aeronautics & Space, Innovation, Management, International

SCHOOL PROPOSING THE MASTER

Mines Albi (Toulouse economic & academic region). The program is taught in partnership with Télécom École de Management (Evry, Paris)

INDUSTRIAL PARTNERS

Airbus, Safran, Dassault, CNES, Latécoère...

LANGUAGE OF TEACHING

English.

ENVIRONMENT

The economic success of actors in the aerospace industry strongly depends on the ability of companies to develop management strategies for research and development, technology transfer and optimization of the overall manufacturing process. This is a strategic issue in the highly competitive sector of the production of materials and structure for aerospace applications. From a technological point of view, the engineers of tomorrow will develop multi-physics and multi-scale approaches adapted to generate innovation that will emerge at the crossroads of scientific disciplines.

In terms of management skills, they will be able to deploy methodologies and implement complex and global organizational processes integrating a multi-cultural dimension to anticipate and accompany the changes due to an ambitious industrial innovation policy.

COURSE AIMS

AeroMat • Innovation offers challenging opportunities to students interested in developing careers in the aerospace industry with both technical (innovation) and managerial skills by:

- > Training high level master students for the future in engineering and innovation management for industry
- > Promoting teaching in close relationships with research most advanced achievements
- > Favouring multi-cultural, multi-physics and multi-scales approaches
- > Providing multi-choices paths for graduation
- > Opening widely to the international dimension
- > Thinking green and fostering a socially responsible innovative industrial spirit

PROGRAM

This is a full-time program of 2 years divided into four semesters: courses over 3 semesters followed by an internship of one semester in a company or in a research laboratory.

The program is composed of 4 teaching units including an integrated and global approach addressing the specificity of the aerospace industrial sector, the materials science and mechanical engineering and the business and innovation management. Skills and competencies acquired will be utilised for the master thesis in a company or a research laboratory.

1. Aerospace engineering

- > Market, technical and economical analysis

- > Architecture, structure and performance of airplanes, launchers and satellites

- > Aerospace project management, quality management, certification and environment rules for sustainable development

- > Aerodynamics and flight dynamics

- > Manufacturing

- > Space techniques and materials in space environment

- > Innovation in aerospace

2. Materials science and mechanical engineering

- > Strategy for selecting & tailoring materials

- > Modelling & simulation in mechanics of materials

- > Physical properties of materials

- > Additive manufacturing

- > Advanced manufacturing processes

- > Diagnosis and control of materials & structures

- > Microsystems

3. Innovation management

- > Principles of management (introduction, business simulation, multidisciplinary team management, soft skills learning, international negotiation)

- > Innovation management (R&T, technology competition models, technology intelligence, organisation & tools, scientific and technological partnership, innovation measure & metrics, intellectual properties, rights & strategy, technology intelligence with patents)

- > Project management (designing innovation project, response to competitive call for tender, press review)

- > Business management (strategy, value chain, firm network, human resources management, intercultural management, business ethics, supply chain management)

4. MSc Thesis

- > 6-month MSc thesis in industry and/ or research laboratory (France or international).

The program also includes company visits and seminars.

LOCATION

Two semesters (M1S1 & M2S1) will be held on the main campus of Mines Albi (UNESCO's World heritage), part of the Université de Toulouse, the capital city of the French southwest region Midi- Pyrénées, ranked among the 12 most dynamic European regions and enjoys a very active and supportive framework. The Midi-Pyrénées is known worldwide for its businesses and research clusters in aeronautical and space sectors. Toulouse is the centre of the European aerospace industry, with the headquarters of Airbus and many other aerospace companies. Toulouse is consistently ranked high in the cities in which students prefer to study (taking 2nd place behind Paris in 2013). Some classes will be arranged in Toulouse (on-site in industry, laboratories or at the "Maison de la formation Jacqueline Auriol" – Toulouse Aerospace campus). One semester (M1S2) will be fully hosted on the campus of Télécom École de Management, in Evry, close to Paris.

ADMISSION REQUIREMENTS

Participants must hold a 4-year Bachelor of Science degree in the field of engineering (aerospace, materials, mechanical) or sciences (physics, chemistry, mechanics).

Participants holding a first experience in industry are also welcome.

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MASTER OF SCIENCE

LANGUAGE REQUIREMENTS

English

- > Mother tongue or
- > Bachelor degree taught in English or
- > English test such as TOEFL IBT 80, IELTS

No prerequisite in French, but TEF II or an equivalent level may be required to obtain a visa.

STRONG POINTS OF THE SCHOOL/ PROGRAM

- > Mines Albi is part of Institut Mines- Telecom, an institution under the authority of the Ministry of Industry
- > Télécom Ecole de Management - Evry is double-accredited: AACSB and AMBA
- > Study in Toulouse and Paris regions, the two leading French and European regions for employment and economic activity in aerospace
- > International Faculty
- > Courses taught entirely in English and in small groups
- > Strong links with industry
- > 6-month master thesis in industry or in a research lab
- > Intercultural seminars
- > Free French language courses
- > A MSc program boosted by reputed research departments
- > An international team for international students
- > A quality-chartered "Welcome to International Students" package

COMPETENCIES ACQUIRED

- > knowledge in basic materials science engineering with a particular attention for research applied to industry, economy and society
- > application of the scientific field of materials engineering in the specific field of aerospace structures with an objective of product performance enhancement.
- > understanding of the industrial sector of aeronautics and space in all its technical, economic, organizational dimensions and regulatory issues.
- > understanding of the strategies and methodologies specific to innovation management: management techniques, techniques of lean design, manufacturing and management, communication, change management, performance management, project management, planning techniques, financial analysis and cost management, resource management, risk analysis methods
- > entrepreneurial spirit and an ability to take into account economic, quality, competitiveness and productivity and business requirements
- > ability to lead a complex project in compliance with quality procedures, to take into account the standards and regulation; to develop a sense of responsibility and of decision-making; and an ability to act effectively.
- > a good ability to integrate into real working life, into an organization, to animate and evolve in it: project management, communication ...
- > a strong ability to work in an international context: fluency in English, cultural and international awareness, knowledge of French culture & language
- > good skills in written and oral communication, to present convincingly and argue a case behind an audience, write and present a summary document, communicate and explain decisions

TYPICAL JOBS

- > R & T Operations Manager
- > Engineer with client, supplier and/or research laboratories interfaces
- > Junior Project manager
- > Project procurement/purchasing
- > Lean Management Officer
- > Engineer / Consultant Technology Watch
- > Engineer / Consultant Intellectual Property

COST

11,000 Euros (4 semesters)
5,000 Euros Europe and Erasmus zone Possible partial fee waivers and scholarships.

SCHOLARSHIP

Scholarships are available depending on academic records and countries of origin (companies, governments, embassies...). Internships are paid and cover living expenses during the last semester.

LODGING

Individual furnished studio apartments are available for international students during their stay, both on Albi (Mines Albi) and Evry campus (TEM). Residences offer all the comfort and facilities to the students. Accommodation at the students' Residence costs about 330 Euros per month. Special grants may be given by the french government for helping students to cover lodging expenses. It corresponds roughly to about half of the rent. The total living expenses should not exceed € 5,000 Euros per year (on campus food and accommodation).

CALENDAR

One intake per year in September.

- > Year 1: one academic semester at Mines Albi – Université de Toulouse and one academic semester at Télécom École de Management in Evry - Paris
- > Year 2: one academic semester at Mines Albi - Université de Toulouse and the Master internship and thesis in industry or in a research lab.

CONTACT

Mines Albi and **TEM Evry** are both part of IMT
Mines Albi – Université de Toulouse

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