



In partnership with



# Aero-Mat Innovation

## Aerospace Materials Design, Manufacturing & Innovation Management

**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 structures for aerospace applications. Technologically, tomorrow's engineers will develop multi-physics and multi-scale approaches adapted to generate innovation where it will emerge, at the crossroads of scientific disciplines. In terms of management, 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.**

**Aero-Mat 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 relationship with research
- Favouring multi-cultural, multi-physics and multi-scales approaches
- Giving international opportunities
- Thinking green and socially responsible innovative industrial development

## Competencies acquired

- Skills and capabilities in basic materials science engineering with a particular attention on research applied to industry, economy and society
- Skills and capabilities in the application of the scientific domain of materials engineering in the specific field of aerospace structures with an objective of product performance enhancement
- Understanding the industrial sector of aeronautics and space in all its technical, economic, organizational dimensions and regulatory issues
- Understanding 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
- An entrepreneurial spirit and an ability to take into account economic, quality, competitiveness, productivity and business requirements
- Ability to lead a complex project in compliance with quality procedures, taking into account the standards and regulation; sense of responsibility, decision making, ability to act effectively
- A good ability to integrate into real working life, into an organization, to animate and evolve in project management, communication ...
- A strong ability to work in an international context: fluency in english, cultural awareness, international experience, knowledge of French culture & language
- Good skills in written and oral communication, to present convincingly and argue a case in front of an audience, write and present a summary document, communicate and explain decisions
- The opportunity to continue for the preparation of a doctoral thesis

## Career opportunities

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

## Admission requirements

Participants must hold a 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.

## Language requirements

### English:

- Mother tongue or
- Bachelor's degree taught in English or
- English test such as TOEFL IBT 80, IELTS 6.0, TOEIC 750, Cambridge CAE.

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

## Contact



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Professor, Head of Master

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## Syllabus

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 used for the master thesis in industry or research.

### PART 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

### PART 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)

**The program also includes company visits and seminars.**

**This program is certified and promoted through the Toulouse Tech network.**

## Calendar

### One intake per year in September

- **Year 1:** One academic semester in Mines Albi and one academic semester in Télécom Ecole de Management in Evry - Paris
- **Year 2:** One academic semester in Mines Albi + 6 month Master thesis in industry or in a research lab.

### PART 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
- Diagnostic and control of materials & structures
- Microsystems
- Surface engineering
- Laboratory work

### PART 4. MSc Thesis:

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

Details of tuition fees can be found on our website



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