

Major	Industrial Engineering		
Master's programme	MANAGEMENT OF 3D INTERACTIVE TECHNOLOGIES-DIGITAL ENGINEERING		
Master's Code	M1 MTI3D-IN		
Qualification awarded	Master's degree in Industrial Engineering		
Programme director	Dr. Ruding LOU (ruding.lou@ensam.eu)		
Mode of study	Level of qualification	Field of study	Language of study
Full time	Master ISCED 7	Engineering ISCED-F-07	French Material in English
ECTS	Campus	Length of programme	Specific arrangements for recognition of prior learning
60	Chalon-sur-Saône	1 year (from September to September)	Yes (VAE or VAP)
Keywords	Digital Engineering, Virtual Reality, Augmented Reality, Mixed Reality, Human-computer interaction, Artificial Intelligence, Rapid prototyping, Industry 4.0, Virtual Twins, Virtual Mock-Up, Human Factors, Virtual Prototyping.		

Admission requirements

Type	Level	Way
French proficiency	Level B1	Certificate
English proficiency	Level B1	Certificate
Previous degree	Third year of Bachelor (L3) minimum, or equivalent, in Engineering or Computer Science	Certificate of achievement

Applicants interested in the Master MTI3D-IN programme must follow the online procedure and adhere to the schedule.

<https://artsetmetiers.fr/fr/formation/dnm-admissions>

Overall objectives

The master MTI3D-IN programme trains engineers and researchers to work in multidisciplinary settings with 3D Interactive Technologies and digital engineering, including Industry 4.0.

- Specialise in digital methods and tools for product/service lifecycle management
- Master 3D interaction design for virtual immersion



Programme learning goals

The table below outlines the competencies to be developed and the anticipated proficiency levels, as defined by the following grading scale:

- 1) Acquire awareness and understanding of both current and emerging challenges in Digital Engineering, 3D Interactive Technologies, and Industry 4.0 applications.
- 2) Demonstrate the ability to participate in and contribute to the development of interdisciplinary approaches that integrate management, design, modelling, prototyping, validation studies involving end-users, and analysis of immersive applications across various sectors.
- 3) Develop expertise in comprehending, communicating, applying, and implementing methods and tools for digital transformation (including 3D technologies, imaging, mixed reality, artificial intelligence), with adaptability to the requirements of users and stakeholders.
- 4) Gain the capability to deploy sustainable solutions utilizing digital technologies.
- 5) Exhibit leadership and innovation within the context of Industry 4.0 and operate effectively in multidisciplinary environments.

Sets of expected abilities	Expected abilities	Expected proficiency level
		R&D
<i>Disciplinary knowledge and reasoning</i>	1.1 Knowledge of underlying mathematics and science	4
	1.2 Core fundamental knowledge of engineering	4
	1.3 Advanced engineering fundamental knowledge, methods and tools	4
<i>Personal and professional skills attributes</i>	2.1 Analytical reasoning and problem solving	4
	2.2 Experimentation, investigation and knowledge discovery	4
	2.3 System thinking	3
	2.4 Ethics, though and learning	4
	2.5 Ethics, equity and other responsibilities	4
<i>Interpersonal skills: Teamwork and communication</i>	3.1 Teamwork	4
	3.2 Communications	4
	3.3 Communications in foreign language	3
<i>Conceiving, Designing, implementing, operating, innovating and entrepreneurship in the context of Corporate Social Responsibility</i>	4.1 External, societal and environmental context	3
	4.2 Enterprise and business context	3
	4.3 Conceiving, systems engineering and management	3
	4.4 Designing	4
	4.5 Implementing	3
	4.6 Operating	3
	4.7 Leading engineering endeavours	4
	4.8 Engineering entrepreneurship	3

The **key strengths** of the **Master 1** MTI3D-IN programme are as follows:

- Comprehensive knowledge of concepts, methods, models, and tools in digital engineering, 3D interactive technologies, and Industry 4.0.
- Advanced practical skills for developing multi-disciplinary digital engineering solutions with attention to user experience.
- Solid grasp of the complete digital chain and related concepts.
- Methodical design and innovation approaches for 3D interactive technology challenges.
- Strong adaptation, integration, analysis, critical thinking, self-learning, communication, valorisation, and organizational skills developed through academic and industry projects.
- International experience gained from global collaborations.

Programme structure

The learning outcomes are achieved through a balanced training program that blends theoretical instruction with practical experiences. Students participate in both academic and real-world industrial settings to develop a broad range of transferable skills.

The MTI3D-IN programme is a two-year Master's course. The **Master 1** is divided into two semesters and it shares several modules with the MTI3D-IVI programme at the Laval Institute.

- **First year (Master 1)**
 - o **First semester (S1): September to March**
This semester includes four technical modules totalling 307 hours, one professional module of 81 hours (which includes language courses), and three technical projects amounting to 300 hours, all together worth 50 ECTS credits.
 - o **Second semester (S2): April to August**
During the second semester, students undertake an internship lasting between 2 and 4 months, worth 10 ECTS credits. This internship may be completed either in France or in another country.

Module Code	Module Title	Sem.	Year	ECTS	Hours	Compulsory/Optional	Teaching modalities
UE11	Software tools	S1	M1	8	85	Compulsory	Course / Exercises
UE12	Engineering	S1	M1	8	69	Compulsory	Course / Exercises
UE13	Virtual environments	S1	M1	10	96	Compulsory	Course / Exercises
UE14	Methods	S1	M1	8	57	Compulsory	Course / Exercises
UE15	Management and communication	S1	M1	8	81	Compulsory	Course / Exercises
UE16	Projects	S1	M1	8	300	Compulsory	Projects
MT1	Master 1 thesis	S2	M1	10	NA	Compulsory	Internship / Apprenticeship

Table 1 : **Master 1** MTI3D-IN programme modules for both semesters.

Study and assessment rules

- Modules are assessed through practical work, projects, reports, presentations, exams, or a combination thereof. Assessment criteria are explained at the start of the programme. Each module receives a score from 0 to 20.
- To pass:
 - o Each module's final mark must be ≥ 10 .
 - o If a student fails a module, they may retake the assessment once.

At the end of the **Master 1** MTI3D-IN programme, the final average is calculated using ECTS distribution, with honours (very good, good, fair, satisfactory) awarded accordingly.

Graduation requirements

To graduate, students must meet the following criteria:

Master 1

- Earn 50 ECTS credits in the first semester;
- Earn 10 ECTS credits in the second semester.

Careers of graduates and access to further studies

Depending on their results and career goals, graduate students may pursue their professional paths as follows::

- Admission from Master 1 to Master 2 may be granted with just 50 ECTS, but the failed module must then be successfully validated during Master 2.