Major	Industrial Engineering		
Master's programme	MANAGEMENT OF 3D INTERACTIVE TECHNOLOGIES-DIGITAL ENGINEERING		
Master's Code	M2 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-O7	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	First year of Master (M1) minimum, or equivalent, in Engineering or Computer Science	Certificate of achievement

Applicants interested in the M2 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

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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
Disciplinary knowledge and reasoning	**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
Personal and professional skills attributes	**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
Interpersonal skills: Teamwork and communication	**3.1 Teamwork**	4
	3.2 Communications	4
	3.3 Communications in foreign language	3
Conceiving, Designing, implementing, operating, innovating and entrepreneurship in the context of Corporate Social Responsibility	**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

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The **key strengths** of the **Master 2** MTI3D-IN programme are as follows:

- Solid foundation in computer graphics and computer vision for 3D rendering and mixed reality.
- Insight into the relationship between human perception and action, as well as multisensory integration, which is critical for designing effective computer-human interactions.
- Expertise in developing and implementing interactive technologies for industrial engineering applications within the context of Industry 4.0.
- Application of a structured scientific research methodology serves as a template for addressing a range of scientific challenges related to 3D interactive technologies.
- 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 2** is divided into two semesters and it shares several modules with the MTI3D-IVI programme at the Laval Institute.

- **Second year (Master 2)**

    o **First semester (S3): September to January**
    This semester includes one professional module of 32 hours (which includes language courses), 5 scientific modules totalling 244 hours and three technical projects amounting to 211 hours, all together worth 30 ECTS credits.

    o **Second semester (S4): February to August**
    During the second semester, students undertake an internship lasting between 4 and 6 months, worth 30 ECTS credits. This internship may be completed either in France or in another country.

Code	Title	Sem.	Year	ECTS	Hours	Compulsory/ Optional	Teaching modalities
UE21	Research methodology	S3	M2	6	57	Compulsory	Course / Exercises
UE22	3D imagery and immersion	S3	M2	4	45	Compulsory	Course / Exercises
UE23	Digital modeling and tools	S3	M2	4	73	Compulsory	Course / Exercises
UE24	Business Knowledge and Language	S3	M2	4	32	Compulsory	Course / Exercises
UE25	Projects	S3	M2	6	211	Compulsory	Projects
UEC1	Perception and Interaction within Virtual Environments	S3	M2	3	25	Compulsory	Course / Exercises
UEC2	Industrial Virtualization	S3	M2	3	44	Compulsory	Course / Exercises
MT2	Master thesis	S4	M2	30	NA	Compulsory	Internship / Apprenticeship

Table 1 : **Master 2** 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:
    - Each module's final mark must be ≥ 10.
    - If a student fails a module, they may retake the assessment once.

Graduation requirements

To graduate, students must meet the following criteria:

Master 2

- Earn 30 ECTS credits in the first semester;
- Earn 30 ECTS credits in the second semester.

At the end of the **Master 2** MTI3D-IN programme, the final average is calculated using ECTS distribution, with honours (very good, good, fair, satisfactory) awarded accordingly.

Careers of graduates and access to further studies

Based on their academic performance and professional aspirations, graduates have several pathways available to them:

- Pursuing doctoral studies (PhD) in fields related to Digital Engineering and Virtual Reality, either within academia or industry (e.g., through CIFRE programmes), with the aim of becoming subject-matter experts in Interactive and Immersive Technologies;
- Serving as R&D engineers or researchers within large corporations or start-ups across various sectors—including manufacturing, construction, services, consultancy—and in diverse domains such as automotive, aerospace, education, healthcare, and IoT;
- Embarking on entrepreneurial ventures within the immersive technologies sector.