Major	Mechanical Engineering		
Master's programme	ADVANCED MANUFACTURING AND MATERIALS SCIENCE		
Master's Code	AM2S M1		
Qualification awarded	**Master in Mechanical engineering**		
Programme director	**ahmed.ktari@ensam.eu**		
Mode of study	*Level of qualification*	*Field of study*	*Language of study*
Full time	**Master (M1)- ISCED 6**	**Engineering, manufacturing and construction**	**English**
ECTS	*Campus*	*Length of programme*	*Specific arrangements for recognition of prior learning*
60	**Aix-en-Provence**	**1 year**	
Keywords	**Mechanical Engineering**		

Admission requirements

Type	Level	Way
English proficiency	**Level B2**	**Certificate**
French proficiency	**Level A2**	**Certificate**
Previous degree	**Previous degree**	**Certificate of achievement**

Applicants interested in the CPSE programme must follow the online procedure and adhere to the schedule.

https://artsetmetiers.fr/en/formation/master-admissions

Overall objectives

- Strengthen advanced foundations in mechanical engineering, materials, and manufacturing processes
- Introduce Industry 4.0 concepts as applied to mechanical systems
- Build scientific literacy and research methodology

Programme learning goals

The table below details the abilities to be acquired and the expected proficiency levels according to the following grading scale:

1) Limited
2) Basic
3) Competent
4) Advanced
5) Mastery

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	**3**
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	**2**
	4.3 Conceiving, systems engineering and management	**3**
	4.4 Designing	**3**
	4.5 Implementing	**3**
	4.6 Operating	**3**
	4.7 Leading engineering endeavours	**4**
	4.8 Engineering entrepreneurship	**3**

Programme structure

- **First year (Master 1)**

Code	Title	Sem.	Year	ECTS	Hours	Compulsory/ Optional	Teaching Modalities
M1-1S3M	Solid mechanics and mechanics of materials	S1	M1	3	30	Compulsory	Lectures, Exercise
M1-1MS	Material science	S1	M1	5	50	Compulsory	Lectures, Exercise, Practical work
M1-1FE	Finite element method and analysis	S1	M1	3	30	Compulsory	Lectures, Exercise, Practical work,
M1-1MT	Manufacturing technologies	S1	M1	3	30	Compulsory	Lectures, Practical work
M1-1MN	Mathematics and numerical methods for engineers	S1	M1	3	30	Compulsory	Lectures, Exercise, Project

Code	Title	Sem.	Year	ECTS	Hours	Compulsory/ Optional	Teaching Modalities
M1-1CAD	Practice on computed assisted design - CAD	S1	M1	2	20	Compulsory	Lectures, Practical work
M1-1COM	Scientific communication (English), scientific Seminars participation	S1	M1	2	20	Compulsory	Practical work/ research project
M1-1LG	French/English language	S1	M1	2	20	Compulsory	Lectures, Exercise
M1-1RP	Research project in the field of mechanics, materials and manufacturing Part I	S1	M1	7	80	Compulsory	Research project
M1-2AdM	Advanced materials	S2	M1	3	30	Compulsory	Lectures, Exercise, Practical work
M1-2MPD	Mechanics for materials, processing and durability	S2	M1	3	30	Compulsory	Lectures, Exercise, Practical work
M1-2PMPQ	Physics of manufacturing processes and Quality control	S2	M1	4	60	Compulsory	Lectures, Exercise, Practical work
M1-2AMSF	Advanced manufacturing and surface functionalization	S2	M1	3	40	Compulsory	Lectures, Exercise, Practical work
M1-2COM	Scientific communication (English), scientific Seminars participation	S2	M1	2	20	Compulsory	Practical work / research project
M1-2LG	French/English language	S2	M1	2	20	Compulsory	Lectures, Exercise
M1-2RP	Research project in the field of mechanics, materials and manufacturing Part II	S2	M1	7	100	Compulsory	Research project
INTERNSHIP	Research Internship	S2	M1	6	6-8 weeks	Compulsory	An internship

Table 1: Detail of the modules of the AM2S M1 programme over the two semesters.

Study and assessment rules

Each module can be evaluated by means of practical works, projects, reports, oral presentations, exams and the assessment rules are explained at the beginning of the programme. Each module is evaluated between 0 and 20.

The control of knowledge and the evaluation of acquired skills are done by traditional examinations and continuous control.

- Notes acquired in continuous review are not subject to a second session. The precise control rules are validated each year by the steering committee.
- A catch-up session is organized 15 days after the last examination of the initial exam session.

Each teaching unit is marked from 0 to 20 and the validation procedures of the TUs are those in force in the ENSAM Pedagogic Rules.

- The control procedures are specified by each TU manager.
- For lessons in the form of lectures, the test may include one or two written exams, at the discretion of the TU managers.

Training, projects, courses, are evaluated both on the basis of continuous monitoring and on the basis of a restitution (report and / or defense).

Retake exams are organized at the beginning of the second semester.

Graduation requirements

To be graduated, students need to comply with the following rules:

Master 1

- Validation of TU for 30 ECTS – semester 1
- Validation of TU for 30 ECTS – semester 2
- Validation of internship (individual project) at the end of semester 2.

Careers of graduates and access to further studies

Depending on their results and professional expectations, graduate students can continue their professional careers as a:

- The AM2S M1 MSc will allow students to continue in all programs requiring this level of study and the enrolment in M2 MSc is a continuation of studies to be favored.
- Upon academic selection, opportunities are given for a dual degree between the AM2S Master of Science
- degree and Master of Science at Texas A&M University