Major	Industrial Engineering		
Master's programme	FACTORY OF THE FUTURE		
Master's Code	FOF - IE		
Qualification awarded	**Master in Industrial Engineering**		
Programme director	**Dr. Eric MONTEIRO, eric.monteiro@ensam.eu**		
Mode of study	*Level of qualification*	*Field of study*	*Language of study*
Full time	**Master**	**Engineering ISCED-F-07**	**English**
ECTS	*Campus*	*Length of programme*	*Specific arrangements for recognition of prior learning*
60	**Paris**	**1 year**	**NO**
Keywords	**Industrial Engineering, Mechanics, Numerical Methods**		

Admission requirements

Type	Level	Way
English proficiency	**Level B2**	**Certificate**
Previous degree	**Bachelor in Engineering, or equivalent**	**Certificate of achievement**

Students interested in the FOF - IE programme must apply online and adhere to the schedule.
Note that there are two different admission procedures depending on applicant's individual situation.

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

Overall objectives

The FOF - IE programme, which marks the transition between the generalist foundations of the bachelor's degree and the specialisation of the master's degree, is designed to offer students more in-depth and targeted training, enabling them to acquire the skills necessary to succeed in their field of specialisation the following year:

- To provide students with introductory classes in advanced engineering topics.
- To train students to model complex systems and use numerical tools to predict their behaviour.
- To become familiar with the different steps of scientific research project.
- To acquire scientific knowledge through a practical approach.
- To learn about French culture and to learn French.

Programme learning goals

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

1) To have experienced or been exposed to the current and future challenges in Industrial Engineering.
2) To be able to participate in and contribute to develop a transversal approach coupling design, simulation, manufacturing and control of Industrial systems in the scope of the Industry 4.0.
3) To be able to understand, explain and manipulate the concepts, methods, models and tools for Industrial Systems Engineering.
4) To be skilled in the practice or implementation of methods, models and tools to simulate the behaviour of Industrial systems and optimize their design.
5) To be able to lead or innovate in the scope of the Industry 4.0 paradigm and within a multi-disciplinary industrial environment.

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	**3**
	4.8 Engineering entrepreneurship	**3**

More specifically, the **key strengths** of the FOF – IE programme are as follows: XXX

Programme structure

Learning outcomes are reached through a well-balanced training programme that combines theoretical and practical learning sequences, during which students are placed in both academic and project-based configurations, in order to develop multiple transversal skills.

The FOF programme is a one-year Master programme that spreads on two semesters (Figure 1). Both semesters are composed of 4 modules divided into different teaching units (Table 1). Each semester corresponds to 30 ECTS.

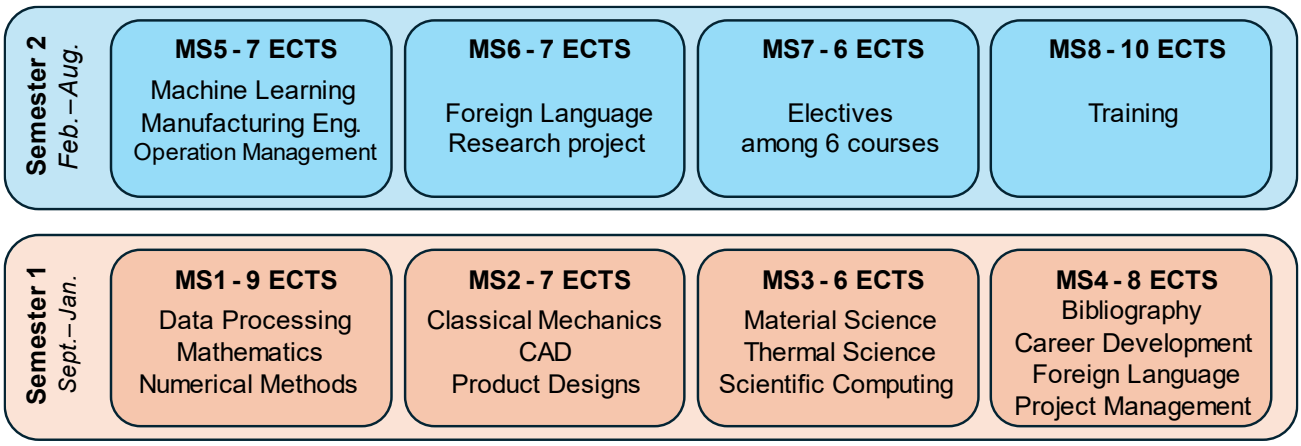

Figure 1: Structure of the FOF - IE programme.

Code	Title	Sem.	Module	ECTS	Hours	Compulsory/ Optional	Teaching modalities
DPST	Data processing	S1	MS1	3	30	Compulsory	Lecture/Exercises
MATH	Mathematics	S1	MS1	3	30	Compulsory	Lecture/Exercises
NUMS	Numerical Methods	S1	MS1	3	30	Compulsory	Lecture/Exercises/Practical
CMCH	Classical Mechanics	S1	MS2	3	30	Compulsory	Lecture/Exercises/Practical
CAD1	Computer-Aided Design	S1	MS2	2	18	Compulsory	Exercises/Practical
PDMS	Product Design Methods	S1	MS2	2	18	Compulsory	Lecture/Exercises/Practical
MAT1	Material Science	S1	MS3	2	18	Compulsory	Lecture/Exercises
THSC	Thermal Science	S1	MS3	2	18	Compulsory	Lecture/Exercises
SCP1	Scientific Computing	S1	MS3	2	18	Compulsory	Exercises/Practical
BIBT	Bibliography Technics	S1	MS4	2	18	Compulsory	Lecture/Exercises/Practical
CDEV	Career Development	S1	MS4	1	6	Compulsory	Lecture/Exercises/Practical

Code	Title	Sem.	Module	ECTS	Hours	Compulsory/ Optional	Teaching modalities
FLE1	Foreign Language	S1	MS4	3	42	Compulsory	Lecture/Exercises/Practical
PMNG	Project Management	S1	MS4	2	12	Compulsory	Lecture/Exercises
IML1	Introduction to Machine Learning	S2	MS5	3	30	Compulsory	Lecture/Exercises/Practical
MENG	Manufacturing Engineering	S2	MS5	2	18	Compulsory	Lecture/Exercises
OMNG	Operation Management	S2	MS5	2	18	Compulsory	Lecture/Exercises
FLE2	Advanced Foreign Language	S2	MS6	3	42	Compulsory	Lecture/Exercises/Practical
RPJT	Research Project	S2	MS6	4	120	Compulsory	Project
FMCH	Fluid Mechanics	S2	MS7	3	30	Optional	Lecture/Exercises
VIBA	Vibrations Analysis	S2	MS7	3	24	Optional	Lecture/Exercises
AERO	Fundamentals of Aerodynamics	S2	MS7	2	18	Optional	Lecture/Exercises
CAD2	Advanced Computer-Aided Design	S2	MS7	2	18	Optional	Exercises/Practical
MAT2	Advanced Material Science	S2	MS7	2	18	Optional	Lecture/Exercises
THDY	Thermodynamics	S1	MS7	2	18	Optional	Lecture/Exercises
INT1	Training	S2	MS8	10	300	Compulsory	Project/Internship

Table 1: Detail of the teaching units of the FOF - IE 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.
- An exam session is organized at the end of the first semester. 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 and projects are evaluated through a report and/or a defence.

Retake exams are organized at the end of each semester or at the beginning of the next semester.

Graduation requirements

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

- Each teaching unit score must be higher than (or equal to) 8.
- Each module score must be higher than (or equal to) 10.

Careers of graduates and access to further studies

To be allowed to continue in the second year of their programme (M2), students are required to obtain a minimum of 60 ECTS.