

Major	Industrial Engineering		
Master's programme	DECISION SCIENCES AND RISK MANAGEMENT		
Master's Code	SDMR		
Qualification awarded	Master's degree in Industrial Engineering		
Programme director	Dr. Marc LASSAGNE (marc.lassagne@ensam.eu)		
Mode of study	Level of qualification	Field of study	Language of study
Full Time	Master ISCED 7	Engineering ISCED-F-07 Management ISCED-F-04	French and English
ECTS	Campus	Length of programme	Specific arrangements for recognition of prior learning
60	Paris	1 year (from September to September)	Yes (VAE or VAP)
Keywords	Decision Sciences, Risk Management, Behavioral Decision Making, Decision Theory, Organization, Risk Analysis, Financial Analysis, Psycho-social risks, Safety Management Systems, Statistics, Qualitative Research Methods, Risk Sociology.		

Admission requirements

Type	Level	Way
French proficiency	Level C1	Certificate
English proficiency	Level B2	Certificate
Previous degree	First-year of Master's (M1) minimum, or equivalent, in Engineering, Economics or Management	Certificate of achievement

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

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

Overall objectives

The programme aims at training future engineers and researchers through a knowledge production process to deal with :

- The decisions making in the context of the ever-increasing uncertainties that companies face.
- The companies' dire need of tools and methods to manage their risks, in particular with the advent of new challenges associated with industry 4.0.

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 be able to model and solve a decision problem under risk and uncertainty.
- 2) To be able use the appropriate research methods (qualitative or quantitative) to develop new knowledge in the field of risk management.
- 3) To be able to understand and overcome the various cognitive biases that are associated with decision-making
- 4) To be able to take into account the organizational dimension in which risk management takes place
- 5) To be able to adopt a multidisciplinary approach to risk management problems through its human, financial and technical dimensions.

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

More specifically, the **key strengths** of the SDMR programme are as follows:

- An approach that mixes management studies, economics and engineering
- A deep theoretical knowledge on the risk management concepts, methods, models and tools
- A multidisciplinary approach to risk management that encompasses all its dimensions

- A learning-by-doing approach in research through the writing of a research article

Programme structure

Learning outcomes are reached through 5 academic modules as well as the design and completion of a research project.

The SDMR programme is a one-year Master’s programme that spreads on two semesters

- **First semester (S3): From September to January**
This semester is composed of 5 thematic modules and a bibliographical research that leads to a research statement defended early February, for a total of 36 ECTS.
- **Second semester (S4): From February to September**
The second semester is dedicated to the realization of the research project that leads to writing a research article for 24 ECTS through an internship. The internship takes place in a research structure (laboratory or company) in France or abroad. Most research articles are defended early July (with a pre-defense early May); if it proves impossible to defend in July, a second session takes place early September.

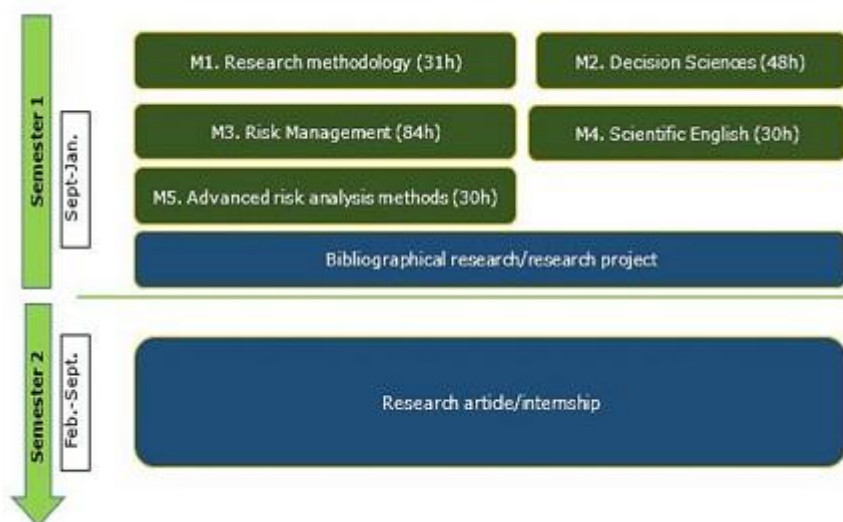


Figure 1 : Structure of the SDMR programme.

Code	Title	Sem.	Year	ECTS	Hours	Compulsory/ Optional	Teaching modalities
EPIS	Epistemology	S3	M2	0	4	Compulsory	Lecture
INFO	Information research methods	S3	M2	0	3	Compulsory	Lecture
QUALI	Qualitative research methods	S3	M2	2	9	Compulsory	Lecture
QUANTI	Quantitative research methods	S3	M2	2	15	Compulsory	Lectures/project
ADERI	Decision Analysis	S3	M2	2	18	Compulsory	Lecture
MICRO	Microeconomics and strategic interactions	S3	M2	2	15	Compulsory	Lecture

Code	Title	Sem.	Year	ECTS	Hours	Compulsory/ Optional	Teaching modalities
RO	Operations research	S3	M2	2	15	Compulsory	Lecture
DECI	Advanced decision theory	S3	M2	2	15	Compulsory	Lecture
MAS	General management (professionalization unit)	S3	M2	3	70	Compulsory	Lectures/project
ORGA	Risk and Organization Theory	S3	M2	2	15	Compulsory	Seminar
RSM	Risk and Management Systems	S3	M2	2	15	Compulsory	Seminar
ST	Work and Health	S3	M2	2	15	Compulsory	Seminar
FIN	Financial markets	S3	M2	2	15	Compulsory	Lecture
ENG	Scientific English	S3	M2	3	30	Compulsory	Seminar
TFI	Advanced financial theory	S3	M2	2	15	Compulsory	Lecture
SDF	Industrial risk analysis	S3	M2	2	15	Compulsory	Seminar
BIBLIO	Bibliographic work/research project statement	S3	M2	6	N/A	Compulsory	Project
PRE	Pre-defence	S4	M2	3	N/A	Compulsory	Project
MEM	Research article	S4	M2	16	N/A	Compulsory	Project
SOUT	Research article defense	S4	M2	5	N/A	Compulsory	Project

Table 1 : Detail of the modules of the SDMR 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.

For each academic module, a weighted average is computed using the ECTS associated with each subject as a coefficient:

- There is no compensation between modules and the final grade of each module must be ≥ 10
- Within each module, the grade associated with a subject must be ≥ 8 , otherwise a remediation exam has to be taken

For the research article:

- The final weighted average of the assignments associated with the master thesis must be ≥ 10 , with additional conditions: if the bibliographical research/research project's grade is ≤ 10 , then it has to be rewritten. If the research article is graded ≤ 10 , it has to be rewritten as well. There are no conditions associated with the pre-defense and defense (and a compensation between grades).

Remediation exams are organized in July.

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 2

- Validate the 30 ECTS associated with the academic modules
- Validate the 30 ECTS associated with the research article

At the end of the SDMR programme, the final average is calculated based on the ECTS distribution, and mentions are awarded (very good, good, fair, passable)

Careers of graduates and access to further studies

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

- PhD student in a field related to Risk management, in academia or in industry (CIFRE)
- R&D engineer/researcher in large companies or start-ups, in numerous sectors (manufacturing, construction, services, consultancy, etc.)