STUDY PLAN (2026-2027)

Mandatory courses for 180 hours, as follows:

A. Foundations Area, 90 hours;
B. Thematic Area, 60 hours;
C. Summer/Winter Schools, 30 hours (or 5 ECTS).

Elective courses taken from Master degrees and/or other doctoral-level courses, for 72 hours (or 12 ECTS)

MANDATORY COURSES

A. Foundations Area

The courses are delivered directly by DTIM to first-year students. They are provided in a dual-mode format, including both in-person activities and videoconferencing.

Methods for research (30 hours)

The course provides the fundamental skills needed to conduct scientific research, guiding students in designing a solid research project and exploring existing research outputs effectively. It develops key scientific communication abilities, covers the basics of intellectual property and the patenting process, and introduces core principles of research ethics. The course also offers practical tools for fundraising and for writing and managing research projects, helping students identify funding opportunities and prepare effective proposals.

Research applied methods (60 hours)

The course provides a solid methodological foundation for rigorous research, focusing on tools for analysing, modelling, and managing information in engineering and technological contexts. It introduces methods for gathering and critically assessing knowledge, quantitative techniques for data analysis, principles of experimental design, and simulation tools for studying complex scenarios. Students also develop skills in programming and data management. A dedicated module addresses sustainability, offering approaches to evaluate and manage the impact of products and industrial processes.

General note: according to DTIM practice**,** 6 hours correspond to 1 ECTS**.**

AREA	COURSE	CONTENT	HOURS
Foundations 90 hours	Methods for research 30 hours	Critical reading and research design	6
		Scientific writing, positioning and oral presentation	6
		Intellectual Property Management – Part 1	6
		Research ethics	3
		Fund raising and project writing and management	9
		Total	**30**
	Research Applied Methods 60 hours	Intellectual Property Management – Part 2	6
		Simulation methods and tools	12
		Statistical learning for research	6
		Design of Experiments (DOE)	6
		Applied Quantitative Methods	6
		Qualitative methods for research	6
		Literature review methods - Part 1	6
		Applied programming	12
		Total	**60**
	Total		**90**

B. Thematic Area

During the second year, students may select thematic offerings either from courses offered directly by DTIM or from courses and workshops provided by other Italian and/or international PhD programmes, for a total of 60 hours. At least 2 courses must be chosen from the DTIM offerings, accounting for a minimum of 30 hours.

Courses delivered by DTIM

The courses focus on advanced management theories, entrepreneurship and innovation, the development of conceptual frameworks based on literature reviews, tools for the automated management of scientific data, topics related to operations and supply chain management, network analysis and control, methods for circular design, and other subjects relevant to applied research.
Courses are provided in a dual-mode format, including both in-person activities and videoconferencing.

Each year, an internal survey will be launched in which students are invited to indicate their course preferences. All courses that reach a minimum of 3 enrolled students are activated.

Courses/Workshop delivered by other Italian and/or international PhD programmes

Students may select thematic courses and/or workshops relevant to their research activities offered by other PhD programmes.

C. Summer/Winter Schools

General note: according to DTIM practice**,** 6 hours correspond to 1 ECTS**.**

Students are required to attend at least 1 Summer or Winter school, corresponding to a minimum of 30 hours (or 5 ECTS). The attendance may take place in any year of the PhD programme.

ELECTIVE COURSES

Students are required to select courses amounting to at least 72 hours (or 12 ECTS), aimed at strengthening the competencies necessary for the conduct of their research activities. These courses may be selected, on an elective basis, from Master's degree programmes and/or other doctoral-level courses offered by national or international institutions.

ORGANIZATION NOTES

Participation in courses offered internally by DTIM is recognised provided that at least 75% of the total scheduled hours are completed, as evidenced by the attendance register.

Participation in external training activities (including thematic and elective courses, seminars, workshops, and Summer/Winter Schools) will be recognised upon submission of appropriate certification issued by the lecturer or the organising institution.

CROSS-DISCIPLINARY COURSES (NON-MANDATORY)

The PhD School provides a selection of courses designed to enhance doctoral students' digital and communication competencies.

General note: according to DTIM practice**,** 6 hours correspond to 1 ECTS**.**