

Introduction to research

Person in charge: Lionel Trojman

Prerequisite: Good English language proficiency (written and spoken)

Organization: Lectures + Projects

Evaluation: Projects: Presentations and Reports

ECTS : 4 credits

Context

This module aims to introduce engineering students to the world of scientific research. It is a question of appropriating the tools and methods of the research: to target the relevant information through specialized sites and bookstores, to read the scientific articles by demonstrating a sense of analysis and criticism, to propose innovative solutions, experimenting and presenting the results in oral but also in writing (publications). These publications (which can be of different types) make it possible to present a work bringing an originality compared to previously published studies. Finally, this module makes students aware of ethics and integrity in research.

Students will put into practice the tools and methods learned in this module through a research project supervised by a tutor of the ISEP Research laboratory (teacher-researcher, doctoral student or postdoctoral fellow).

Objectives

- Specialized skills
 - Act in project mode
 - Know how to act as prime contractor
 - Detailed requirements specification: move from "business model" to "analysis model"
 - Make optimized and adapted technical choices
 - Technical requirements specification: basis of project developments and achievements
 - Understand research methods and know how to apply them in ICT
 - Master bibliographic research and describe the state of the art on a given topic
 - Experiment specific methods on the subject
 - Produce results that add value to the intelligence of the subject

- Cross-functional skills
 - Act as a dynamic actor in a group
 - Work in a team, in a network, and in a culturally diverse environment
 - Lead a team, motivate and evolve it
 - Manage conflicts, diversity and differences
 - Be able to come up with new ideas and proposals
 - Act as a good communicator in an international scientific and technical environment
 - Document effectively and easily exploitable, regardless of the intended audience, activities performed or products achieved
 - Act as a responsible professional concerned with strategic issues
 - Demonstrate rigor, act with professional integrity and intellectual honesty
 - Show critical thinking and autonomy
 - To care about disseminating technical and scientific knowledge
 - To be interested in the results of research in fields related to his profession
 - Ensure the development of one's own skills

Concepts

The following concepts, whose understanding is an objective of the module, will be addressed:

- Definition of research: procedures, organization and purposes
- Targeting information (specialized sites, books, open archives, etc.)
- Bibliographic study: synthesis of the research works
- Modeling a scientific problem
- Writing a scientific publication
- Ethics, integrity and scientific rigor

Pedagogical Approach

Four supervised sessions will be organized as part of this module. A first session is an introduction to the world of scientific research and the presentation of projects to be selected select individually or by team. The second session is dedicated to the bibliographic study; it is about a restructuring course allowing validating the work that would have been previously provided by the learners within the framework of their projects. The third session is dedicated to the modeling of scientific issues and the introduction to the writing of articles. A fourth framed session is dedicated to the introduction to ethics and scientific rigor. Finally the last session is dedicated to the final defenses.