CENTRALE NANTES

ENGINEERING PROGRAMME

2024-2025

Year 3

Professional Option

Research and Development

OP REDEV

PROGRAMME SUPERVISOR

Mickael HILAIRET

Autumn Semester

Course unit	ECTS Credits	Track	Course code	Title
UE 92	4	Core course	PROINNOV PRORD1	Industrial Property, innovation R&D project Part 1

Spring Semester

Course unit	ECTS Credits	Track	Course code	Title
UE 102	1	Core course	METMET PRORD2	Research methodology and overview of jobs in public and private R and D R&D project Part 2

Industrial Property, innovation [PROINNOV]

LEAD PROFESSOR(S): Mickael HILAIRET

Requirements

Objectives

The objective of this course is to:
- make students aware of industrial property issues (knowledge bases, exploitation rights and freedom, business strategy, conquering markets)
- familiarize them with the tools to manage scientific and strategic data like patents and registered trademarks.

The course is given by a lecturer from the INPI (Institut National de la Propriété Industrielle).

Course contents

1 - Presentation of INPI. How to protect technical creations, software, design, distinctive signs etc. Presentation of the different IP (Industrial Property) rights. Challenges and purposes. Acquisition of IP rights in France and abroad. Corporate and employee's IP rights.
Good habits and traps to avoid. Contracts relative to IP.

Defence of rights: actions for infringement. Industrial Property and Economical Intelligence.

2 - Patents database: source of scientific and strategic information. Presentation and use of patents databases.

3 - Case studies on the strategy to be adopted by a company in order to protect and value its creations: freedom to operate, implementation of adequate protection strategies, IP strategies, partnership, cost, protection abroad, property of creations, defence, implementation of technological watch and competitive intelligence.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	2	22 hrs	10 hrs	0 hrs	0 hrs	0 hrs

R&D project Part 1 [PRORD1]

LEAD PROFESSOR(S): Mickael HILAIRET

Requirements

Objectives

The students undertake a project in pairs within ECN's laboratories or in collaboration with an industrial partner. The project extends into the second semester.

Course contents

The project takes place within an ongoing action and includes external partners. The core of the project consists of scientific work, although students will also be made aware of overall organisation, funding mechanisms, constraints and the final objectives of the project. Projects can be associated to ongoing research actions with public (national, European) and/or private partners. The project can also provide support for a CIFRE contract. The work may also involve developing laboratory experiments.

Course material

Assessment

Collective assessment: EVC 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	2	0 hrs	0 hrs	0 hrs	44 hrs	0 hrs

Research methodology and overview of jobs in public and private R and D [METMET]

LEAD PROFESSOR(S): Mickael HILAIRET

Requirements

Objectives

The "Research methodology and overview of carreers" module proposes, on the one hand, an initiation into the methodology grounding any research activity, around questions of bibliographic research, scientific ethics, dissemination via publications, and social networks. On the other hand, the different types of research careers are presented. An overview of professions linked to R&D activities is produced, through the testimony of R&D researchers and engineers working in different types and scales of industrial structures (large industrial group, technological research institute in public-private partnership, public establishment of an industrial and commercial nature, SMEs and start-ups). A presentation of the different professions of academic research, in France and abroad, is also given: preparation of a doctoral thesis, careers as research engineer, teacher-researcher, full-time researcher.

Course contents

1. Research methodology. Research organizations and funding mechanisms, specificities of the French model. Research evaluation (authorities, bibliometrics). Scientific ethics and plagiarism. Collaborative networks. Carrying out of a bibliographic study. Role plays on the evaluation of research projects.

2. Academic research careers. Pursuing doctoral studies: why, how? Universities and research laboratories in France. Different professions and statuses: doctoral student, post-doctoral fellow, teacher-researcher, "EPST" or "EPIC" researcher, research engineer, technical and administrative support.

3. Experiences and testimonies in industrial research by engineers / researchers in structures of varying size, from large international groups to start-ups (list subject to modifications): EDF, IRT Jules Verne, CNES, Keosys, Dilepix.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	0.5	18 hrs	14 hrs	0 hrs	0 hrs	0 hrs

R&D project Part 2 [PRORD2]

LEAD PROFESSOR(S): Mickael HILAIRET

Requirements

Objectives

The students undertake a project in pairs within ECN's laboratories or in collaboration with an industrial partner. The project starts in the first semester.

Course contents

The project is undertaken in a laboratory at the school (or with a partner), integrated with course work and clearly defined, with external partners. Students should immerse themselves in a structured R&D action, to be aware of its overall organisation, funding mechanisms, constraints (deadlines, etc.), and results. The scientific aspect obviously has priority and lies at the core of this study: students also have to solve a problem that is part of the action in which they are participating. Projects can be associated to currently running research actions with public (national, European) and/or private partners. The project can be a support of a CIFRE contract. The work may also involve the development of laboratory experiments.

Course material

Assessment

Collective assessment: EVC 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	0.5	0 hrs	0 hrs	0 hrs	40 hrs	0 hrs