SHAKE THE FUTURE.

CENTRALE NANTES

ENGINEERING PROGRAMME

PROFESSIONAL OPTION

RESEARCH AND DEVELOPMENT

AUTUMN SEMESTER

Établissement public sous tutelle du
ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation

GROUPE **CENTRALE**

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INNOVATION

RESEARCH AND DEVELOPMENT, ENGINEERING PROGRAMME PROFESSIONAL OPTION
AUTUMN SEMESTER

Professor: Sébastien BOURGUIGNON

Objectives

To raise student awareness of innovation management and project management (especially in small and medium-sized enterprises).

Course contents

From idea to project:

- Innovation strategy and strategic innovation
- Project management: planning and budget
- Complement financial resources

From project to product:

- Information and technological survey: creativity, feasibility
- Partnerships and collaborative projects

Course material

Keywords

Technological watch, strategy, funding, partnerships, intellectual property, project set-up

Links with other programmes

Industrial Property, Research Methodology, Industrial R&D, R&D Projects

LANGUAGE	ECTS CREDITS	LECTURES	TUTORIALS	LABO	PROJECT
French	*	15 hrs	0 hrs	0 hrs	0 hrs

* Successful completion of all courses in the semester leads to the award of four ECTS credits.

INDUSTRIAL PROPERTY

RESEARCH AND DEVELOPMENT, ENGINEERING PROGRAMME PROFESSIONAL OPTION
AUTUMN SEMESTER

Professor: David MOREL

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 employees IP rights.
- Good habits and traps to avoid.
- Contracts relative to IP.
- Defence of rights: actions for infringement.
- Industrial Property and Economical Intelligence.

2) Patent database:
- Source of scientific and strategic information.
- Presentation and use of patent 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

Keywords

Links with other programmes

Innovation, Research Methodology, Industrial R&D, R&D Projects

LANGUAGE	ECTS CREDITS	LECTURES	TUTORIALS	LABO	PROJECT
French	*	12 hrs	6 hrs	0 hrs	0 hrs

* Successful completion of all courses in the semester leads to the award of four ECTS credits.

INDUSTRIAL R&D

RESEARCH AND DEVELOPMENT, ENGINEERING PROGRAMME PROFESSIONAL OPTION
AUTUMN SEMESTER

Professor: Sébastien BOURGUIGNON

Objectives

This course introduces the students to the organization of R&D in companies, its position in relation to other departments, the emergence and control of research and innovation projects, by presenting different case studies.

Course contents

Half-day or full-day seminars from researchers in private companies:

- Alexis Girin, R&T Manager Robotics, Cobotics and Augmented Reality, IRT Jules Verne:

The French industrial sector is composed of many diverse skills. At Jules Verne Institute for Research and Techonolgy, we specialize in advanced production techonologies for naval construction, aeronautics, energy and car factory. In the team Robotics, Cobotics and Augmented Reality, we have around 15 projects and collaborations in all related fields. This course aims at showing how research projects arise from the analysis of industrial needs, of returns on investment, and of the correlation between production needs / R&D timing.

- Patrick Massin, Head of the *Institut des Sciences de la Mécanique et Applications Industrielles* laboratory, EDF R&D:

This course presents EDFs R&D activities and the related different job types. Links with activities of other EDF departments are presented. First, general EDF activities are presented, together with the international energy context surrounding the company. Then, detailed R&D activities and the importance of R&D within the company are described. The different kinds of R&D positions and corresponding activities are discussed. The focus is then set on structural and material mechanics. Finally, a study case related to an R&D project is proposed, on which the students analytical capacities are tested.

- Jean-Baptiste de Chaisemartin and Aliaume Breteau, Bee Healthcare company:

Place and impact of R&D in technology entrepeneurship.

Course material

Keywords

Links with other programmes

Industrial Property, Research Methodology, Innovation, R&D Projects

LANGUAGE	ECTS CREDITS	LECTURES	TUTORIALS	LABO	PROJECT
French	*	12 hrs	0 hrs	0 hrs	0 hrs

* Successful completion of all courses in the semester leads to the award of four ECTS credits.

Research Methodology

Research and Development, Engineering programme professional option
Autumn Semester

Professor: Sébastien BOURGUIGNON

Objectives

This course aims to provide a concise presentation of research work and those who undertake it.

Course contents

- Research structures.
- Research stakeholders.
- The evaluation of research.
- How to undertake research.
- How to present results.
- Ethics.
- Networks.
- Bibliography.

Course material

Keywords

research, stakeholders, ethics, bibliography, results, methodology

Links with other programmes

LANGUAGE	ECTS CREDITS	LECTURES	TUTORIALS	LABO	PROJECT
French	*	5 hrs	0 hrs	0 hrs	0 hrs

* Successful completion of all courses in the semester leads to the award of four ECTS credits.

R&D PROJECT

RESEARCH AND DEVELOPMENT, ENGINEERING PROGRAMME PROFESSIONAL OPTION
AUTUMN SEMESTER

Professor: Sébastien BOURGUIGNON

Objectives

The students undertake a project in pairs within ECNs 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

Keywords

Links with other programmes

2nd Semester R&D Project, Research Methodology, Industrial Property, Innovation, Industrial R&D

LANGUAGE	ECTS CREDITS	LECTURES	TUTORIALS	LABO	PROJECT
French		0 hrs	0 hrs	0 hrs	40 hrs

* Successful completion of all courses in the semester leads to the award of four ECTS credits.