

## WP1100

### Challenges of the 21st Century: Introduction

**Professor:** Franck Richecoeur

**Language of instruction:** French – **Number of hours:** 50 – **ECTS:** 3

**Prerequisites:** None

**Period:** S5 between September and January IN15COM, FEP5COM

#### Course Objectives

The objectives of the course are to help students to:

- ◇ Better understand their future role as engineers facing 21st century challenges,
- ◇ Discover in depth one of the many challenges they could have to work on during their career,
- ◇ Tackle fuzzy problems and uncertainty as encountered by engineers,
- ◇ Work in team on a real project that represents a first experience.

The seven thematics studied are the following:

- ◇ Economic mutations
- ◇ Energy
- ◇ Environment
- ◇ Health and biotechnologies
- ◇ Information and knowledge
- ◇ Territory: sustainable construction
- ◇ Transportation and mobility

#### On completion of the course, students should be able to

- ◇ understand broadly the issues related to the challenge they study,
- ◇ learn methods of documentary analysis and project management,
- ◇ model complex systems
- ◇ report well written conclusion
- ◇ present orally technical material

#### Course Organization

- ◇ General introduction seminars to each of the challenges (six 3-hr seminars)
- ◇ Workshop on one of the challenges (eight to ten 1.5-hr working sessions)
- ◇ A team project, continued over semester 6

Each challenge is directed by professionals from academia (*Référent Enjeu Interne* or REI) and industry (*Référent Enjeu Externe* or REE).

#### Evaluation

- ◇ Report and oral defense on the problem statement of the project at mid-semester,
- ◇ Report and oral defense of the ongoing project at the end of the semester

## WP1200

### Challenges of the 21st Century: Team Project

**Professor:** Franck Richecoeur

**Language of instruction:** French – **Number of hours:** 50 – **ECTS:** 3

**Prerequisites:** None

**Period:** S6 between February and June IN16COM, SEP6COM

#### Course Objectives

- ◇ Develop the ability to work within a team
- ◇ Develop a multi-disciplinary approach to problem solving: technical, economic, marketing, social, etc.
- ◇ Expose students to complexity (fuzzy problems, multi-solutions problems)
- ◇ Expose students to "real life" problems
- ◇ Apply techniques of problem solving, communication, etc.
- ◇ Acquire knowledge in the field of the project

#### On completion of the course, students should be able to

- ◇ better work within a team
- ◇ increase their ability to deal with complexity
- ◇ better communicate (written and oral communication)
- ◇ have acquired knowledge on one of the global challenges
- ◇ solve problems with a 360° approach (technical, marketing, economical, social, etc.)
- ◇ increase their ability to deal with fuzzy problems

#### Course Organization

Students work in teams of four to six, supervised by a project client (CPR) and a pedagogic referent (RP). Each challenge is directed by professionals from academia (*Référent Enjeu Interne* or REI) and industry (*Référent Enjeu Externe* or REE).

#### Evaluation

The progress of the project team is evaluated using a project review at mid-semester (oral defense and report). The project is assessed in a final defense in which conclusions of the study are presented. The rating reflects the overall work done by the team during the semester.

After the final defense, all teams compete for the Project Grand Prize, awarded by a jury of specialists from academia and industry.