INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON

INNOV@INSA

4-week Short Program on Innovation
90 Contact Hours - 2 Tracks
12 ECTS / 6 US Credits

From May 16th to June 14th 2024

Track 1

French Language, Cross-Cultural Communication, Industry and Society

Track 2

Management, Innovation and Design

OR

Connected and Smart Devices

Lyon – An Essential European City

When you choose Lyon, you choose one of the most attractive cities in Europe, an international competitor and a gateway to the rest of the world. Being France's 2nd most important city, it is located in the heart of the thriving Auvergne-Rhône-Alpes region. The city was classified as World Heritage Site by UNESCO in 1998. Ancient capital of the Gauls, it testifies of 2000 years of history. Lyon has been recognized as France's 1st city for culture outside of Paris and is indeed characterized above all by the balance between its cultural institutions of excellence offering quality programming, its large-scale festivals, and its cultural venues open to all.

With its many fields of excellence, Lyon is a major international hub: Life Sciences, Clean Technologies, ITC, to name a few. The city is also home to internationally-renowned companies and major players, including: Sanofi, Mérial, Lafarge, GL Events, Bank of China, Solvay Rhodia. In addition, many world-renowned organizations have chosen Lyon as the location for their headquarters or regional offices: Handicap International, World Health Organization, CIRC (International Cancer Research Center), Interpol, Euronews.

Lyon is also a favorite city for foreign students who represent 10% of the student population in Lyon and strengthen the city's international character.

INSA Lyon – A Leading Engineering School in France

INSA Lyon is one of France's leading universities for science and technology. Our five-year program trains multi-skilled, humanist, innovative engineers equipped with an entrepreneurial spirit and a strong international culture.

Diversity, excellence, openness and innovation are the driving forces that lead INSA Lyon students to become responsible engineers. Founded in 1957, INSA Lyon embodies an avant-garde and resolutely modern vision of engineering.

INSA engineers boast excellent scientific and technical expertise, are capable of understanding the issues at the heart of their companies, and actively contribute to the evolution of their world.

On the higher education scene, it ranks among the top 10 engineering schools in Europe. Its purpose is also to become a centre for research and innovation recognized throughout the world, a partner of choice for business and industry.

INNOV@INSA
Short Program on Innovative Engineering and Management

During this 4-week short program, students will learn about perspectives in Engineering and Innovation through innovative and interactive teaching. While planting the seeds of an innovative and sustainable engineering project, students will enjoy hands-on experiments and acquire valuable international experience for their professional futures.

Students will get to know French culture and the beautiful city of Lyon, and learn some French. This short program is also a perfect opportunity for students to discover INSA Lyon, a place they may want to come back to in their course of studies!

COURSE DESCRIPTIONS

Disclaimer

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If you have any questions about the INNOV@INSA program, please do not hesitate to contact Sophie BAUMANN – Coordinator for the program – innov-may@insa-lyon.fr

Track 1 : French Language, Cross Cultural Communication, Industry and Society

Hours and Credits: 45 total contact hours; 6 ECTS / 3 US credits

Prerequisites: none

Academic Coordinator: **Elisabeth AUMEUNIER** – elisabeth.aumeunier@insa-lyon.fr

PART I.A: INTRODUCTION TO FRENCH LANGUAGE AND CULTURE

OBJECTIVES AND METHODS

The focus of this unit will be on the oral French used in daily life. Using action-based language teaching methods, this class will require students to use the French they learn in various situations both during in-class activities and in real-life situations on-site in Lyon. The overall goal is to introduce the students to various cultural aspects of life in Lyon.

FINAL PROJECT

During the final class, the students will go on a shopping trip to *Les Halles de Lyon* with their teachers where they will be expected to use the language skills they have acquired to find their way from the INSA campus to *Les Halles* and once there, to interact appropriately with the vendors in order to greet, explain their needs, taste local products and make their purchases.

Examples of on-site activities:

- A neighborhood treasure hunt: finding your way around and learning about the neighborhood
- Discovering French lifestyle, shopping at a street market, going to a café...

Some of the linguistic tools necessary:

- Greeting and taking leave
- Introducing yourself
- Describing where you are and how to get where you are going
- Express your preferences and personal tastes
- Sample, order, purchase, pay

PART I.B: FRENCH LANGUAGE AND CULTURE FOR INTERMEDIATE AND ADVANCED STUDENTS

Intermediate and advanced students of French, depending on the number, will either be taught in a class or tutored by a teacher to accomplish a couple of tasks independently. Whether you have a class or work independently, the main objective of the course is to discover the city of Lyon: social life, cultural activities, points of interest, history and more. At the end of the course, you will give a presentation on one aspect of the city of Lyon. Of course, all of it in French!

PART II: DEVELOPING INTERCULTURAL COMPETENCE

COURSE INTRODUCTION

Why the need for this course?

If we consider today's globalization, internet, and the general shrinking of time and space, intercultural/cross-cultural interactions have become a certain necessity in people's daily lives. The course is designed to help tackle the challenges of living in a world in which we are increasingly asked to interact with people who may not be like us in fundamental ways. Its overarching goals are to help one become more sensitive to differences in cross-cultural communication and to provide students with the knowledge and skills that will help them interact successfully with people from cultures other than their own, while connecting it to the language learning.

COURSE CONTENT

This course is designed to interrogate different aspects of cross-cultural communication and cultural differences: language, family life, social relationships, work, government, education, love, and religion. Throughout the exploration of these topics, we will strive to engage in self-reflection, practical experience, and understanding of connections to larger social structures.

OBJECTIVES

Specifically, the goals of this course are to describe, learn about, and see social and cultural differences conformed to a model, to provide a space for students to reflect on their own personal experiences. Students will be encouraged to engage with different cultures in practical ways and to experience cross-cultural communication in meaningful ways.

- → Understand the role of communication in culture
- → Recognize cultural variables
- → Become familiar with communication norms, rituals, and taboos of other cultures
- → Discover barriers to cross-cultural communication, adaptation to other cultures and culture shock
- → Practice communication activities as they would occur in other cultures
- → Learn how differences in intercultural communication manifest themselves in different professional contexts
- → Increase sensitivity to one's own cultural context and its impact on how one communicates, increase knowledge of ethical issues in cross-cultural communication, and increase sensitivity to communicating with people from different cultures

PART III: INDUSTRY AND SOCIETY

OBJECTIVES AND METHODS

Using a case-study approach, we will use our location in Lyon, France's 'Second City', as a base for studying the impact of different industries on society and social institutions over time. The students will acquire a knowledge base which will significantly add to what the French refer to as their 'culture générale'.

DOWNTOWN LYON - Industrial and architectural landscapes and their social consequences

Overview of the evolution of Lyon focused on major historical developments: Lugdunum with the Roman Empire, the silk industry and the urban modernization of the 19th century. The idea is to present how a local development (the silk industry) has brought in major social developments with national, regional and European resonance; how a national development (urban modernization) has been implemented locally and how the two intertwine, leading us to the second visit.

CROIX-ROUSSE District – Industrial, architectural landscapes and their social consequences

In the 19th c. the central hub of the silk industry in Lyon was the Croix-Rousse district. The specific way the silk industry was organized has had major consequences in the way buildings and neighbourhoods were designed. Designs which we can still appreciate today (both inside and outside of the buildings). The social advances for which the workers have fought also prefigure later social movements of the 20th century. The main idea is to study the heritage of the "Canuts" (the Croix-Rousse silk workers) and its contemporary developments. Nowadays, the Croix-Rousse District remains unique in Lyon like a lively and multicultural village in town!

GRADE DISTRIBUTION

Participation – 10%

Group presentations – 15%

(Inter)cultural self-analysis – 20%

"Dear diary" – 10%

Cultural presentation – 20%

Final test – 25%

TRACK 1 IS COMPULSORY.

STUDENTS MUST CHOOSE BETWEEN TRACKS 2A AND 2B

Track 2a: Management and Innovation in Europe

Hours and Credits: 45 total contact hours; 6 ECTS or 3 US credits

Prerequisites: none

INTRODUCTION – THE CIBUM CHALLENGE

The whole track is driven by an innovation project called the CIBUM challenge (Creativity to Innovation to Business Model) which is conducted by students organized in project teams. The students will have to conduct an innovative project.

Each team will have to offer a customer-centric, innovative business solution with a positive impact. This will be a solution for solving a problem observed by them in a given environment and students are asked to prepare the launching strategy of the business. The jury will evaluate the students' abilities to pitch a business project, to be a creative team staying focused on users' / customer's needs, to build a proof-of-concept mock-up, to draft a first business model, to build an action plan to mitigate relevant major risks of their project, to set up a process of project management, to overcome difficulties mainly due to cross cultural variances and to perceive different features between the French market and their own country. An oral presentation will be part of the assessment.

PROJECT MANAGEMENT OF INNOVATIVE PRODUCTS & SERVICES

OBJECTIVES AND METHODS

Design Thinking has been proven to be the most effective method of delivering innovative products and services. This series of courses gives students a foundation in the concepts and solutions required for successful completion of a project when faced with the inevitable cost, schedule, and resource constraints. Emphasis will also be put on understanding the notion of business with positive impact. This methodology will also present various methods and tools to apprehend a topic with efficiency and reward team effort to find a solution to any problem.

The course is designed as a combination of traditional lectures, exercises, case studies, quizzes, workshops, and group discussions. Students are expected to practice some of these tools and methods on a global team challenge which covers the learning expectations.

LEARNING SKILLS

→ Multidisciplinary teamwork, co-creation

→ Cross cultural vision

→ Getting a better understanding of European markets

→ Creativity, generation of ideas, reassessment of one's own judgements

→ Ethnology principles and tools (human science)

→ Learning customer centric vision, empathy

→ Understanding and analysing existing problems on a specific market

→ Market analysis, choice of positioning

SYLLABUS

- **Design Thinking Lessons**
    - Challenges in cross-cultural design
    - Defining the project
    - Developing a project plan
    - Reducing project duration
    - Team decision making
    - Risk management
    - Leadership
    - Design Thinking principles
    - Creativity methods
    - Marketing basis

- **Tools and Exercises**
    - User-centered research
    - Persona study and their context
    - Product journey mapping
    - Brand promise and storytelling
    - SWOT / USP
    - Model making

FINAL EVALUATION:

At the end of the course, each team will have to "pitch" their value creation in front of "potential clients" with the support of a visual presentation.

The students will have to explain the decisions they have made and the difficulties they have overcome. They also have to compare their short experience with the French / European people and expectations.

JUDGING CRITERIA FOR THE PRESENTATION:

→ Awareness of the market context

→ Originality of the solution and innovation

→ Technical feasibility

→ Business viability

→ Attitude and persuasion

COURSE GRADE

Collective assessment
Project written presentation – 30%
Oral presentation – 40%

Individual assessment
Attitude, proactivity, efficiency in a group – 30%

Track 2b: Connected Devices and Smart Devices

Hours and Credits: 45 total contact hours; 6 ECTS or 3 US credits

Prerequisites: algorithmics and basics in any programming language

Academic Coordinator: **Loïc SEVRIN** – loic.sevrin@piwio.fr

PART I: INTRODUCTION TO THE INTERNET OF THINGS (IOT)

OBJECTIVES AND METHODS

This lecture series provides an overview of the concepts and challenges of the Internet and its ever-evolving ability to interconnect people, processes, data, and things that we call the Internet of Things. The course is practical, and case-study based. To enhance learning and retention, this course introduces practical "how-to" guidance, tools and design methods that students can apply immediately through various labs and tutorials. Classes will typically consist of lectures, guest speakers from both industrial and academic backgrounds, rapid prototyping tools, in-lab exercises, and discussions of case studies.

SYLLABUS

- **Introduction to the Internet of Things:**
  - What is the IoT?
  - What are some of the basic applications?
  - What are the broad technical concepts powering the IoT?
- **Introduction to connected devices:**
  - What are the main challenges when designing and industrializing connected devices?
  - How is physical data acquired?
  - How is it transmitted?
- **Introduction to data collection and processing:**
  - How is data stored in IoT systems?
  - Which tools can be used to process data and gain valuable insights on the physical world?
  - What are the main challenges to store and process this data efficiently?
- **Introduction to geographical data processing:**
  - How is data stored in geographical systems?
  - Which tools can be used to process geographical data?
- **Introduction to connected objects security:**
  - What are the attack vectors for connected devices?
  - How can connected objects be secured?
- **Technical introduction: Javascript, HTTP, MQTT and HTML**

This is an entry-level course and the only prerequisites are some knowledge of and practical experience in computer programming.

PART II: CONNECTED DEVICE AND PLATFORM GROUP PROJECT

OBJECTIVES

Students will collaborate with classmates on an IoT-related group project, where they will build a connected platform providing a service in the application field of their choice.

SYLLABUS:

The project will be structured as follows:

- **Creativity session: Students will decide on an application field (e.g., health, smart cities, etc.) and an outline of the project.**
- **Implementation:**
    - Technical architecture: Students will architect the solution that will be deployed in their project (e.g., decide which sensors to implement, which communication protocol they will use, etc.) based on the constraints of the selected application field.
    - Technical implementation: Working in small groups, students will implement their solution using the provided materials (computer-on-module, sensors, actuators, etc.).
- **Presentation: Students will present their project, more particularly:**
    - What problem is their project trying to solve?
    - What is the technical architecture? How was teamwork divided?
    - What are business use cases that could fit their project?

EVALUATION:

Multiple choice quiz (30% of the grade) related to Part I.

Project evaluation (70%) based on an oral presentation. The evaluation will factor in project results, presentation quality and implication.

REFERENCES:

Kleppmann, M. (2017). Designing data-intensive applications: The big ideas behind reliable, scalable, and maintainable systems. "O'Reilly Media, Inc.".

Rowland, C., Goodman, E., Charlier, M., Light, A., & Lui, A. (2015). *Designing connected products: UX for the consumer Internet of Things*. "O'Reilly Media, Inc.".

The INNOV@INSA Team is looking forward to welcoming you next summer!

CONTACT

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