



Mission

Train future engineers able to bring technology, innovation and operation excellence to the industrial fields



Description

Technological and industrial organizations needs to develop projects involving high-skilled engineers able to work on a cooperative basis within interdisciplinary and intercultural teams. At UTSEUS, engineering students are getting technical, methodological and interpersonal skills to address challenges of the industrial fields, either if they are majoring in mechanical, computer sciences, material, electronics, industrial or urban systems.

- UTSEUS *International engineers* are trained to **management** in several project based courses taking in account quality, cost, time and environmental constraints. They develop strong team work capacities. Besides the pedagogical aspect, applied projects allow each student to tailor their curriculum to their career objectives as the projects. Guidance on project management is provided by a professor-researcher, and on-the-spot supervision on the project is ensured by a tutor at company level.
- UTSEUS *International engineers* get comprehensive understanding and operational skills to reinforce **cross-company functions in industrial companies** by getting competencies:
 - about the concepts, methods and tools for designing and deploying of Quality Management System (QMS) and Operational Excellence approach (Lean).
 - Maintenance management, from computer systems to human interactions
 - Risk management assessment, modelization and improvement of security in the industrial environments
 - Supply chain management and purchasing : analysis a value creation chain organization
 - Product life cycle and eco-design
- UTSEUS *International engineers* understand the **latest technologies, raising disciplines and trends** so they can take the best of it along their career:
 - data science
 - serious gaming
 - open innovation

With more than 70% of the courses given by industrials and professionals, the students are developing their **professional attitudes** such as ability to provide effective presentations, perform interviews, or ensure smooth written and oral communication in English and Chinese in an international environment.

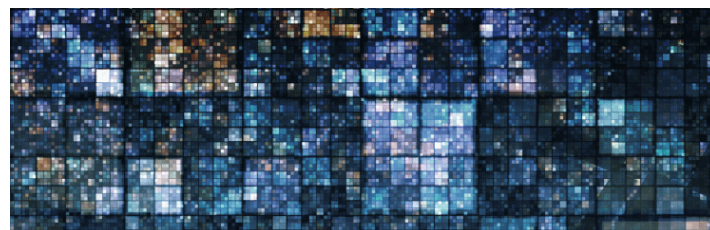


2017 YEAR

LIST OF LECTURES

Course category	Course name	ECTS credits	Compulsory (C) or optional (O)
Scientific knowledge	Introduction to data science and machine learning	6	O
Scientific methods & tools	Data Science: Advanced visualization and cartography	6	O
	Open innovation and entrepreneurship	6	O
	Industrial risk and maintenance management	6	O
	Quality management and operational excellence	6	O
	Life cycle engineering & eco-design	6	O
	International purchasing & supply chain management	6	O
	Project management	6	C
Social sciences	Leadership & presentation skills	3	O
	Approaching China	6	O
Languages	Chinese Mandarin for beginners IE	6	C
	Chinese Mandarin Intermediate IE	6	
	Chinese Mandarin Advanced IE	6	
Other	Project realisation	3	C
	Chinese Traditional Arts & Games	0	O

Category:	Scientific knowledge
Language of instruction	English
Number of hours	
- In class	30H
- Project	20H
- Non-supervised	100H
ECTS	6
Open to IE program	Yes, as optional lecture
Open to LCI program	No



Prerequisites

This course is aimed at students with little or no prior programming experience. Since Data Science involves its own modes of thinking, a logical aptitude and a desire to understand computational approaches to problem solving will be necessary to succeed.

Course Overview and Objectives

The first course objective is to give student an overview of the various areas of application of Data Science. It covers the major methods, tools and theories to get data, explore large heterogeneous datasets and visualize them in a relevant and efficient way. Student will be introduced to Python ecosystem, and must apply the acquired knowledges with practical exercises and projects.

The second module provides an introduction to machine learning. Basic concepts on pattern recognition and supervised learning are reviewed. Classical methods such as support vector machines, neural networks, decision trees, k-nearest neighbors and boosting among others will be studied. Practical sessions will cover several case studies.

The evaluation takes the shape of a hackathon. More information : <http://utseus.com/en/news/2016/12/05/hackathon-urban-data-challenge-2016/>

Course Planning

course	tutorial	technology
1 Data Science Philosophy	jobs opportunities and tools	
2 Python Intro	Python Intro	Python
3 Python Advanced	Python Advanced	Python
4 Network Theory	Network Visualization	Gephi
5 Search Engine	Network Creation & Design	networkx
6 Data Harvesting	Crawler Design	Scjite + Networkx + Requests
7 Data Visualization	Maps and Diagrams	cartodb, d3.js
8 Complex Systems Introduction	Simulation	Netlogox
9 Machine Learning Intro Concept	Machine Learning Tutorial	scipy, R
10 Machine Learning Intro Concept	Machine Learning Tutorial	scipy, R
11 Machine Learning Advanced Concept	Machine Learning Tutorial	scipy, R
12 Complexity Project Competition	Hackathon	all
13		

Professors



Fabien Pfaender
 Associate Professor | UTSEUS | utseus.com
 Researcher & Coordinator | ComplexCity Lab | complexcity.org
 Chair | UNESCO International CS-DC e-lab Urban Complex Systems



Philippe Xu
 Associate Professor | UTC | utc.fr
 Researcher | CNRS, UMR 7253 Heudiasyc laboratory | hds.utc.fr

UM02 Data Science: Advanced visualization and cartography v.2017

Category:	Scientific methods & tools
Language of instruction	English
Number of hours	
- In class	40H
- Project	20H
- Non-supervised	100H
ECTS	6
Open to IE program	Yes, as optional lecture
Open to LCI program	Yes, as optional lecture



Course Overview and Objectives

This course will teach you how to effectively present any information in a visual way using theories ranging from art, statistics, design and computer graphics. That is becoming an expert in creating diagrams/charts, learning how to present your thoughts, ideas and results through very effective visualization and get familiar with new interactive visualizations techniques. Hence you will get strategic skills into communicating your ideas and explore datasets to create value. Moreover the course introduces advanced graphic techniques and tools to manipulate graphs as well as latest mapping tools and services to create very effective geographic and semantic maps.

Category:	Scientific methods & tools
Language of instruction	English
Number of hours	
- In class	40H
- Project	20H
- Non-supervised	100H
ECTS	6
Open to IE program	Yes, as optional lecture
Open to LCI program	No



Course Overview and Objectives

In growing numbers of economic sectors, value creation processes are in deep change. They appear to be more and more resting on: the development of new methods of interaction between users/clients/suppliers and, more generally, between stakeholders; the introduction of new hybrid economic models. In our increasingly digitalized world, each of us is at the same time consumer and co-creator of value. Growth and value creation is henceforth based mainly on the management of intangible assets (brands, knowledge, networks, collective intelligence and innovativeness, etc.). As such, companies selling apparently nothing may still have a very high market capitalization. All fields of human activity are affected by these changes including manufacturing. This course offers a multidisciplinary approach to innovation and aims to introduce students new innovation process and the management of intangibles through a multidisciplinary approach. It is designed so that the students themselves develop an innovative process leading to the proposal of innovative products, services, systems and contribute platforms.

Additional thematic conferences and workshops will be organized along the semester to illustrate.

Students will be involved in an assignment in partnership with NETEXPLO Observatory on Digital Innovation (UNESCO).



Lecturer

Patrick Berbon is an entrepreneur and an investor in entrepreneurial ventures. He brings a global perspective from his experience in Asia, Europe and the USA and a sound scientific background from his Ph.D. in Materials Science and R&D activities at a leading US laboratory.

Patrick is co-founder and Managing Partner at China Materialia, an Open Innovation advisory firm and Venture Capital fund focused on Innovation and China. As part of China Materialia Venture Capital fund, Patrick is on the board and very involved in Original Life, a modern agriculture company working on aquaponics, Camray, an X-ray tube company based on carbon nanotubes, Octadem, a portable spectrometer company using LEDlight, and Thingple, a leader in RFID solutions for manufacturing.

Patrick worked as a R&D Scientist at Rockwell Science Center and founded California Nanotechnologies, a materials company now traded on the Toronto Venture Exchange, as a spin-off of the Science Center.

PhD : Materials Science from the University of Southern California in Los Angeles

BS: Ecole Centrale in Lyon

Category: Scientific methods & tools



Language of instruction English

Number of hours

- In class 40H
- Project 20H
- Non-supervised 100H

ECTS 6

Open to IE program Yes, as optional lecture

Open to LCI program No

Course Overview and Objectives

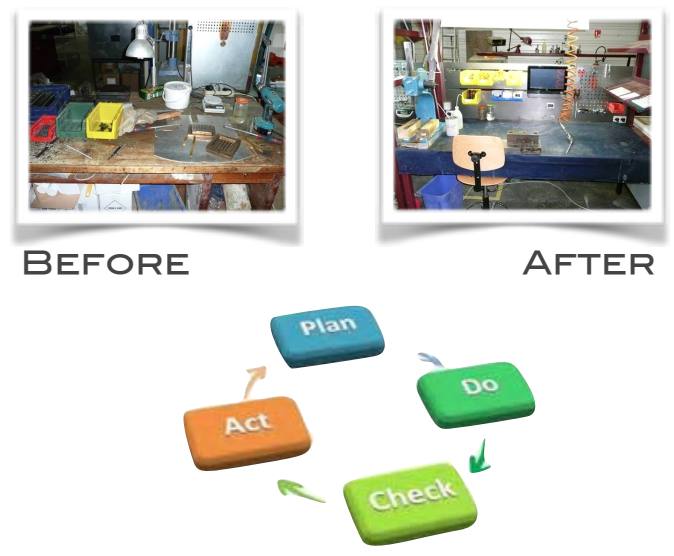
The content of the course is organized to provide a comprehensive approach mixing academic, professional and applied aspects as follows:

- Security in the industry: assessment and modelization
(two-days immersive course, in Air Liquide engineering center)
- Risk modelization: from problems to practical tools
- Management of maintenance: from computer systems to human interactions

Students will have to drive a real company project into completion.

More information about this course : [link to article](#)

Category:	Scientific methods & tools
Language of instruction	English
Number of hours	
- In class	40H
- Project	20H
- Non-supervised	90H
ECTS	6
Open to IE program	Yes, as optional lecture
Open to LCI program	No



Course Overview and Objectives

The main objective of the teaching unit “Quality Management and Operational Excellence” (QMOE) is to introduce and reinforce student’s competencies about the concepts, methods and tools for designing and deploying of Quality Management System (QMS) and Operational Excellence approach (Lean).

QMOE is based on courses (lectures), workshops (serious game for audit, lean and six-sigma) and an applied project in a company.

Keywords : quality management, quality management system (ISO 9001), Toyota Production System (TPS), audit management (ISO 10011), audit practices, 5S, Just In Time (JIT), Total Productive Maintenance (TPM), Lean manufacturing, Lean design, Six-Sigma.

More information about this course : [link to article](#)

Category: Scientific methods & tools

Language of instruction English

Number of hours

- In class 40H

- Project 30H

- Non-supervised 90H

ECTS 6

Open to IE program Yes, as optional lecture

Open to LCI program No



Course Overview and Objectives

The objective of the course is to present and use the software tools to support collaborative design and 3D modelling in order to evaluate product performances.

The course covers:

- Architecture of software systems and theoretical
- Concepts on geometrical models
- Digital mock-up
- Product lifecycle management

The project proposed will require to use PLM software, to achieve a mock-up and to understand the way to build it in simultaneous engineering, in distributed design teams. The way to exploit the shared data in order to evaluate product performances will be introduced and illustrated for evaluating environmental impact using Life Cycle Analysis. A LCA software will be used to achieve the project.

Category:	Scientific methods & tools
Language of instruction	English
Number of hours	
- In class	40H
- Project	20H
- Non-supervised	90H
ECTS	6
Open to IE program	Yes, as optional lecture
Open to LCI program	No



Course Overview and Objectives

The objective of this course is to provide future engineers and project managers with a global overview of the Supply Chain, the Purchasing and the Logistics challenges in an international and competitive environment.

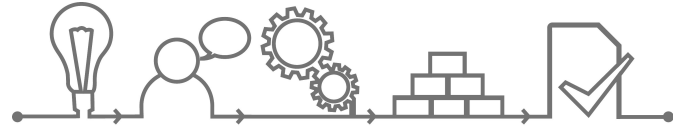
Students will learn how to efficiently interact with these departments and how to involve them as well as the suppliers at the right stage of product development process, in order to achieve competitive advantage in cost, quality, lead-time, technology, flexibility and end customer responsiveness. Particular attention will be paid on the “production purchasing” concept.

After successfully completing this course, students shall be able to:

1. Understand and define key concepts
2. Understand and acquire the commonly used vocabulary (jargon)
3. Analyse a value creation chain organization
4. Apply basic negotiation techniques

Teaching method is based on a comprehensive approach mixing theoretical and applied aspects. Students will have to apply knowledge in practice during problem-solving sessions or real case-based discussions. The final project will be related to real issues from the industry.

Category: Scientific methods & tools



Language of instruction English

Number of hours

- In class 30H

- Non-supervised 45H

ECTS 3

Open to IE program Yes, as compulsory lecture

Open to LCI program No

Course Overview and Objectives

This course includes in-class lectures, workshops, coaching, and a real company project led by groups of 2 to 4 students from the beginning until the end of the semester.

Students teams and projects are defined at the very beginning of the semester with partners companies.

The course aims:

- to let students understand and practice project management using different processes, methodologies (agile, scrum, waterfall, lean, etc.) and tools (collaborative platforms, plannings, presentations, etc.)
- to bring different backgrounds students to learn and work in a collaborative mind-set to achieve one common goal
- to let students working together solving real issues with concrete outputs for a company, a research lab or other organization with quantified expectations
- to learn how to communicate and motivate Chinese and international professionals in international organizations

Students teams have a company tutor and get teaching and coaching sessions on project management all along the semester.

One day per week is dedicated to the company project.

Category: Social Sciences

"You're not allowed to use the sprinkler system to keep your audience awake."

Language of instruction English

Number of hours

- In class 30H

- Non-supervised 45H

ECTS 3

Open to IE program Yes, as optional lecture

Open to LCI program Yes, as optional lecture



Course Overview and Objectives

This course is divided in two modules of 15 hours. It includes coaching and thematic seminars to help future engineers, managers and entrepreneurs get more confidence when addressing a public, or when performing job interviews.

The first module "Which leader are you?" is about know yourself better, identify your strengths, weaknesses and enhance your inner motivation.

The second module will help you design your presentations and deliver your ideas using various techniques, such as professional keynote address or elevator pitch.

Category	Social Sciences
Language of instruction	English
Number of hours	
- In class	40H
- Non-supervised	120H
ECTS	6
Open to IE program	Yes, as optional lecture
Open to LCI program	Yes, as optional lecture



Course Overview and Objectives

This course introduces general main concepts of intercultural and checks them through examples in multinational firms with reference to case studies in China. It proceeds exploring the Chinese paradox in sciences and technologies: China has developed a great part of the inventions and technologies in the world before the 17th century but missed the industrial revolution (1750-1870). Another step will be dedicated to a review of main sources of traditional Chinese thinking (Confucianism, Taoism, Legalism, Buddhism in particular) from a contemporary point of view.

The practical aims of this course are:

- to help students discover and appreciate Chinese culture in its true dimensions
- to get a better understanding of the legacy of Chinese thinking that can help us to deal with complexity and the challenges of sustainable growth in China and elsewhere.

At the end of this course, students must be able to:

- Define main concepts, historical facts and major dates of China History (starting from -2500 B.C)
- Understand the legacy of traditional Chinese thinking
- Exploring the Chinese paradox in sciences and technologies along the History
- Express ideas and positions on the topics

Category:	Social Sciences
Language of instruction	Chinese/English/French
Number of hours	
- In class	60H
- Non-supervised	90H
ECTS	6
Open to IE program	Yes, as compulsory lecture
Open to LCI program	No



Course Overview and Objectives

This course enable students to master language syntax and structure, related cultural knowledge, reading and writing comprehension, gradually develop the ability to use Chinese language flexibly and effectively for social and professional purpose.

The students will be expose to real-life situations during extra-scholar activities with their teachers.