CENTRALE NANTES

MASTER OF SCIENCE, TECHNOLOGY AND HEALTH

2025-2026

YEAR 2

MECHANICAL ENGINEERING

ENERGETICS AND PROPULSION

PROGRAMME SUPERVISOR(S):
Xavier TAUZIA

YEAR 2 - Autumn Semester

CORE COURSES

Course code	Title	ECTS Credits
COMBU	Combustion	4
GDAHT	Gas Dynamics and Heat Transfer	4
HYPPER	Hybrid Propulsion and Perspectives	4
ICENG	Internal Combustion Engines	4
LABSIM	Practical and Simulation	4
PROJECT	Project	4
TUMAC	Turbomachinery	4

LANGUAGE COURSES

Course code	Title	ECTS Credits
CCE3	Cultural and Communication English	2
ESP3	Spanish Language	2
FLE3	French Language	2

YEAR 2 - Spring Semester

CORE COURSES

Course code	Title	ECTS Credits
THESIS	Master Thesis or Internship	30

Combustion [COMBU]

LEAD PROFESSOR(S): Alain MAIBOOM

Objectives

The main objectives are:

- To provide fundamental knowledge on combustion and pollutant emissions formation and reduction.
At the end of the course the students will be able to:
▪ Write combustion reactions in the case of stoichiometric or lean mixture
▪ Calculate the heating value from formation enthalpies
▪ Calculate the adiabatic temperature after combustion
▪ Evaluate auto ignition
▪ Calculate laminar flame velocity
▪ Use the mixing variable Z to describe diffusion flames

- To present some technical aspects of the combustion process in machines (internal combustion engine, gas turbines) and strategies to reduce pollutant emissions.

Course contents

The fundamental aspects of combustion are presented in the first part of the course. The main points presented in these lectures are:
▪ A brief introduction to combustion phenomena and the main applications
▪ Initial and final state: thermodynamics, equilibrium
▪ Chemical kinetics
▪ Reactive flow governing equations
▪ Auto-ignition
▪ Gaseous premixed flames
▪ Laminar diffusion flames
▪ Auto-ignition
▪ Gaseous premixed flames
▪ Laminar diffusion flames

The second part of the course deals with a study of combustion and the formation of pollutant emissions in the combustion chamber of some machines (piston engines and gas turbine). Strategies to reduce pollutant emissions are also covered. Practical class exercises are conducted and corrected as a part of the course.

Post-processing methods to reduce pollutant emissions are covered in a separate course.

Course material

▪ Poinsot & Veynante, Theoretical and Numerical Combustion
▪ http://elearning.cerfacs.fr/combustion/index.php

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure

Sustainable Development and Social Responsibility Positioning

This course deals during lectures and tutorials with sustainable development, in particular: efficient combustion, alternative fuels including decarbonized fuels, and reduction of air pollutant emissions.

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	20 hrs	10 hrs	0 hrs	0 hrs	2 hrs

Gas Dynamics and Heat Transfer [GDAHT]

LEAD PROFESSOR(S): Xavier TAUZIA

Requirements

Fundamentals of applied thermodynamics and IC engines

Objectives

At the end of the course the students will be able to:

- Build an engine model using GT-Power simulation software
- Run simulations and extract results
- Analyze and optimize the volumetric efficiency and engine performance
- Evaluate the main heat transfers (conduction, convection, radiation) under steady state and transient conditions
- Calculate heat-exchangers

Course contents

This course is divided of two separate parts:

Part I: Gas Dynamics
First, the students will learn how to use the GT-Power software (during practical sessions), a simulation tool used in order to study the behaviour of an engine. A case study is then proposed in order to study the influence of the intake characteristics and different technologies on the engine volumetric efficiency and performance.

Part 2: Heat Transfer
The main heat transfer processes are presented, as well as the governing equations. Specific methods used for heat-exchanger design are also provided. Tutorials present some thermal applications.

Course material

- Internal Combustion Engines, Giancarlo Ferrari, Societa editrice Esculapio
- Fundamentals of Heat Exchanger Design, Shah and Sekulic, John Wiley & Sons
- Fundamentals of thermodynamics, Borgnake and Sonntag, John Wiley & Sons

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure / Responsible consumption and production

Sustainable Development and Social Responsibility Positioning

This course focuses on sustainable development, primarily through tutorials, by: - implementing more efficient heat exchange to improve the efficiency of energy conversion systems (work, heat, or cold production, batteries, etc.) - limiting heat exchange (insulation) to reduce heat loss (buildings, etc.) - optimizing gas exchange in a IC engine to improve its efficiency (and thus reduce its greenhouse gas emissions) using specialised software

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	6 hrs	24 hrs	0 hrs	0 hrs	2 hrs

Hybrid Propulsion and Perspectives [HYPPER]

LEAD PROFESSOR(S): Xavier TAUZIA

Requirements

Basics of IC engines and energy conversion

Objectives

Give an overview on two promising technologies for clean propulsion: hybridization and fuel cells. Basic principles, main components, system design and calculation/simulation.
The general market for these technologies is discussed, as well as potential future developments.

Course contents

There are two distinct parts:
1. Hybridization
The “Hybrid” part is split between lectures that will give a good base of knowledge regarding hybrid systems and their components, and then a “lab” where students are tasked to simulate a hybrid vehicle over various load cycles and determine optimum configurations based on various performance targets.
2. Fuell cells:
This course delves into the essentials of fuel cell technology covering foundational principles, system design, and practical applications. Students will begin by exploring the context of Fuel cell from the climate change to the "Power to X" concept, examining the role of fuel cells in renewable energy storage and conversion. After an introduction to the history of fuel cells and the key developments that have shaped the field, the course moves into the fundamentals of fuel cell operation, including their main components and core functions.
The progression from single fuel cells to larger stacks designed for higher power output is then explored. Different types of fuel cells, high and low temperatures ones are introduced, with comparisons of their specific advantages, efficiency levels, and ideal applications. Thermodynamic aspects are covered as well, focusing on factors affecting performance, including efficiency, power output, and voltage-current relationships.
The course also emphasizes the importance of the Balance of Plant (BoP) in fuel cell systems, detailing supporting components and design strategies for creating complete, optimized fuel cell systems. Hands-on exercises are included to provide practical experience in analyzing fuel cell behavior, assessing efficiency, and practicing system design. By the end of this course, students will understand not only the workings of fuel cells but also how to design, analyze, and optimize them, all while appreciating their significance in addressing climate change.
This course includes 4h of lecture (CM) and 2h of practical exercises (TD), providing a comprehensive overview of fuel cell technology

Course material

▪ J. Conti, International energy outlook 2016 Report No. DOE/EIA0484 US Energy Information Administration (eia), Washington DC (2016).
▪ J. M. Andújar et F. Segura, « Fuel cells: History and updating. A walk along two centuries », Renewable and Sustainable Energy Reviews, vol. 13, no 9, p. 23092322, déc. 2009, doi: 10.1016/j.rser.2009.03.015.
▪ T. Wilberforce et al., « A comprehensive study of the effect of bipolar plate (BP) geometry design on the performance of proton exchange membrane (PEM) fuel cells », Renewable and Sustainable Energy Reviews, vol. 111, p. 236260, sept. 2019, doi: 10.1016/j.rser.2019.04.081.
▪ Z. U. Bayrak et M. T. Gencoglu, « Application areas of fuel cells », 2013 International Conference on Renewable Energy Research and Applications (ICRERA), p. 452457, oct. 2013, doi: 10.1109/ICRERA.2013.6749798.
▪ L. Khotseng, « Fuel Cell Thermodynamics », in Thermodynamics and Energy Engineering, IntechOpen, 2019. doi: 10.5772/intechopen.90141.

▪ T. Vidović, I. Tolj, G. Radica, et N. Bodrožić Ćoko, « Proton-Exchange Membrane Fuel Cell Balance of Plant and Performance Simulation for Vehicle Applications », Energies, vol. 15, no 21, Art. no 21, janv. 2022, doi: 10.3390/en15218110.
▪ N. Atasay, A. Atmanli, et N. Yilmaz, « Liquid Cooling Flow Field Design and Thermal Analysis of Proton Exchange Membrane Fuel Cells for Space Applications », International Journal of Energy Research, vol. 2023, no 1, p. 7533993, 2023, doi: 10.1155/2023/7533993.

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure / Responsible consumption and production

Sustainable Development and Social Responsibility Positioning

This course, through lectures, tutorials, and projects, focuses on sustainable development, primarily through: - the study of alternatives to combustion engines (fuel cells) - hybridization (electric, wind assistance, etc.) - optimal energy management in a complex system

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	16 hrs	12 hrs	2 hrs	0 hrs	2 hrs

Internal Combustion Engines [ICENG]

LEAD PROFESSOR(S): Xavier TAUZIA

Requirements

Basic knowledge in applied thermodynamics

Objectives

At the end of the course the students will:

- Know the main parts of a reciprocating piston engine
- Know the main types of engines and their applications

And be able to:
- Calculate engine performance and efficiency using theoretical thermodynamic cycles
- Evaluate the engine and/or vehicle performance and efficiency using measured maps and/or data
- Calculate air and fuel flow rates using simplified assumptions
- Calculate a turbocharger / supercharger
- Calculate a thermodynamic energy recovery device

Course contents

The main points presented in this course are:

- Some technological aspects of reciprocating piston engines
- Geometrical parameters; performance and efficiency indicators
- Main engine applications
- Design and control strategies to improve efficiency
- Engine hybridization and energy recovery devices
- Intake and exhaust systems
- Air charging systems
- Fuel induction systems, new clean fuels
- Combustion and emission production
- Emissions reduction techniques and after-treatment devices

Course material

- J.B. Heywood, Internal Combustion Engine Fundamentals, McGrawHill
- W. Pulkrabek, Engineering Fundamentals of the Internal Combustion Engine, Pearson

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure / Responsible consumption and production

Sustainable Development and Social Responsibility Positioning

This course covers Sustainable Development through lectures and tutorials, primarily by imparting knowledge and applying it to concrete examples to: - reduce GHG emissions associated with IC engines, through improved energy efficiency, the use of decarbonized or carbon-neutral fuels, and even carbon capture - reduce air pollutant emissions - reduce the energy consumption of IC engines by improving its efficiency and utilization - improve sustainability (particularly through retrofitting) / life cycle analysis (especially for fuels)

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	20 hrs	10 hrs	0 hrs	0 hrs	2 hrs

Practical and Simulation [LABSIM]

LEAD PROFESSOR(S): Xavier TAUZIA

Requirements

fundamentals of applied thermodynamics and IC engines

Objectives

At the end of the course the students will be able to:

- Simulate an internal combustion engine using 0D/1D commercial simulation software (AMESim)
- Optimize some engine design or engine control parameters using simulation
- Perform basic studies on an experimental test-rig
- Analyse experimental data

Course contents

This course is broken down into two separate parts.

Part I: Engine Simulation with AMESim:
- How to build a model using elements from various scientific libraries (multi-physics approach)
- How to run a model and analyse results
- How to use simulation to modify engine design and calibration in order to optimize performance / efficiency / emission reduction

Part II: Practical work
- Engine test bench
- Engine assembly
- Fan & Air turbine test rigs
- Heat exhanger test rig
- Combustion test rig

Course material

AMESim user manual and tutorials

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure

Sustainable Development and Social Responsibility Positioning

This course addresses sustainable development through tutorials and practical sessions, primarily in two ways: SIM: using software to improve the efficiency of a conversion system and reduce its emissions LAB: practical work on the impact of design or setting parameters of energy conversion systems on their energy

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	4 hrs	12 hrs	16 hrs	0 hrs	0 hrs

Project [PROJECT]

LEAD PROFESSOR(S): Xavier TAUZIA

Requirements

Fundamentals of energy conversion and propulsion

Objectives

The aim of this project is to present students with a real-world problem in order to combine their technical skills with project management skills – for example, in the role of a design office responding to a call for tenders.

Course contents

Once the design brief is understood, each group will have to split the workload in an efficient manner.

- A literature review will outline a set of technological solutions that could meet the requirements, as well as their pros and cons (readiness level, cost etc.)
- After selecting a technology based on sound reasoning, dimensioning will be necessary in order to draft a response to the specifications.
- A presentation defending the chosen solution alongside a written report will conclude the project.

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure

Sustainable Development and Social Responsibility Positioning

Project-based learning focused on decarbonisation (new topic each year) and teamwork/project management.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	0 hrs	0 hrs	0 hrs	48 hrs	0 hrs

Turbomachinery [TUMAC]

LEAD PROFESSOR(S): Georges SALAMEH

Requirements

Fluid mechanics
Thermodynamics

Objectives

At the end of the course the students will be able to:

- Understand the concept of a turbomachine and its different types: compressible and incompressible fluid turbomachines.
- Identify the different parts of a turbomachine and define the role of each.
- Calculate and draw the velocity triangles.
- Apply the similarity laws to different turbomachine applications.
- Describe the operating principle of a pump, a compressor and a turbine.
- Determine the required and the available net positive suction head of a pump.
- Understand the risk of cavitation and surge and identify their limits.
- Choose and dimension a turbomachine for a specific application (pump, gas turbine, turbocharger, turbojet etc).
- Define and calculate the different forms of efficiency (isentropic, polytropic, mechanical, volumetric, hydraulic etc) and determine their influence on the operating machine
- Use the performance maps of a turbomachine (turbine, compressor) with the similarity analysis.

Course contents

First, the general relationships describing the operation of a turbomachine and the classification of these machines will be presented. After presenting Euler's theorem, the layout and operation of a centrifugal pump will be detailed: wheel, pressure, and diffuser. The concept of efficiency of these machines will also be discussed and the phenomena of cavitation presented. An application for a compressible fluid machine will then be processed.

After detailing the operation of a turbocharger, the entropy diagram will be studied as well as the determination of efficiencies, various losses and work on the shaft. Thereafter, the characteristic curves of turbomachines (characteristic curves of compressors and turbines) will be analyzed. Finally, the relationships of similarity will be detailed. This course will end with the study of some application cases: start-up of a gas turbine, turbochargers, rocket turbopumps, etc.

Course material

- P. Chesse, Turbomachine à fluide compressible et incompressible (Ecole Centrale de Nantes)
- M. Pluviose, Machines à fluides, principes et fonctionnement (Edition ellipses 2010)
- M. Pluviose, Turbomachines hydrauliques et thermiques (Edition Eyrolles, 1988)
- M. Sedille, Turbomachines hydrauliques et thermiques, (Tomes 1,2,3, Masson Paris)
- D. Japiske and N.C. Baines, Introduction to turbomachinery (concepts ETI, Inc and Oxford Univ. Press)

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure

Sustainable Development and Social Responsibility Positioning

Turbomachinery is an essential element in clean energy production and decarbonized propulsion.

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	4	12 hrs	18 hrs	0 hrs	0 hrs	2 hrs

Cultural and Communication English [CCE3]

LEAD PROFESSOR(S): David TROYA

Objectives

- Understand the fundamental principles of scientific writing and the importance of clarity and precision in communication.
- Structure scientific documents effectively, adhering to genre-specific conventions.
- Employ appropriate language and tone for diverse scientific audiences.
- Integrate and cite sources correctly to support research arguments and findings.
- Edit and revise their writing for coherence, style, and grammatical accuracy.
- Prepare and deliver scientific presentations, both written and oral.

Course contents

Introduction to Scientific Writing

Overview:

This course provides an essential foundation in scientific writing, equipping students with the skills necessary to effectively communicate research findings and scientific concepts. Through a combination of lectures, workshops, and practical assignments, students will learn the conventions of scientific writing, including structure, style, and clarity. The course will cover various types of scientific documents, such as research papers, literature reviews, grant proposals, and poster presentations.

Course Structure:

The course will be organized into weekly sessions that include lectures on theoretical concepts, hands-on writing exercises, peer review workshops, and discussions of exemplary scientific literature. Students will engage in collaborative projects and receive constructive feedback to enhance their writing skills.

Assessment:

Students will be assessed through a combination of assignments, including written documents, peer review participation, and presentations. Active participation in workshops and discussions is also required to foster a collaborative learning environment.

Course material

Hoogenboom BJ, Manske RC. How to write a scientific article. Int J Sports Phys Ther. 2012 Oct;7(5):512-7. PMID: 23091783; PMCID: PMC3474301.

Paré G, Kitsiou S. Chapter 9Methods for Literature Reviews. In: Lau F, Kuziemsky C, editors. Handbook of eHealth Evaluation: An Evidence-based Approach [Internet]. Victoria (BC): University of Victoria; 2017 Feb 27. Available from: https://www.ncbi.nlm.nih.gov/books/NBK481583/

How to Create a Research Poster. A guide fo creating a research poster. https://guides.nyu.edu/posters

Sustainable Development Goals (SDGs) covered by this course

Industry, innovation and infrastructure / Quality education

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	2	0 hrs	32 hrs	0 hrs	0 hrs	0 hrs

Spanish Language [ESP3]

LEAD PROFESSOR(S): Marta HERRERA

Requirements

N/A

Objectives

For beginners:
Practice and reinforcement of the five skills (oral and written expression and comprehension as well as interaction)
Acquisition of vocabulary and linguistic structures
Be able to talk about yourself and those around you
Be able to express oneself during daily activities
Know how to give your opinion

For advanced students:
Practice and reinforcement of the five skills (oral and written expression and comprehension as well as interaction)
Acquisition of specialised vocabulary
Be able to understand the essential content of concrete or abstract subjects including a technical discussion
Be able to communicate spontaneously and fluently
Be able to express oneself in a clear and detailed manner, to express an opinion on a topical subject

Course contents

For beginners:
Personal environment (introduce yourself, express yourself, your tastes, your character, your hobbies, etc.), your surroundings (friends, family, location, climate), your interests (sports, leisure)
Present tense (regular and irregular)
Language patterns to express habit, obligation, "gustar" and its equivalents,
Possessive adjectives
Differences between "es", "está", "hay"
Use of "por" and "para"
Adverbs and frequency patterns
Numeral adjectives

For advanced students:
Knowledge of the Hispanic world (economic, technical, cultural and social environment)
Present tense (regular and irregular)
Imperative
Past tenses
Direct / indirect style
Future tense
Conditional tense
Present and past subjunctive moods

Course material

Preparation manuals, our own tailor-made documents, written and internet press, general civilization documents, digital tools

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Decent work and economic growth / Gender equality / Goo health and well-being / Industry, innovation and infrastructure / No poverty / Partnership s for the goals / Peace, justice and strong institutions / Quality education / Reduced inequalities / Responsible consumption and production / Sustainable cities and communities / Zero hunger

Sustainable Development and Social Responsibility Positioning

Key competencies for sustainability Collaboration: the abilities to learn, to understand and respect others; to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving. Critical thinking: the ability to reflect on one's own values, perceptions and actions. Self-awareness: the ability to reflect on one's own role in a group; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
Spanish	2	0 hrs	32 hrs	0 hrs	0 hrs	0 hrs

French Language [FLE3]

LEAD PROFESSOR(S): Silvia ERTL

Requirements

N/A

Objectives

The objective is to familiarize the learner with the French language and French culture through an entertaining task-based communicative language teaching, focused on speaking combined with:
- Phonetics
- Self-correcting exercises on our learning platform
- Learning Lab activities
- Project work
- Tutoring

Course objectives include the acquisition and reinforcement of vocabulary, syntax, and pronunciation by both traditional means and through the use of digital resources. Students will learn general French, develop language skills of oral and written comprehension and expression.

After completing this course (32 hours + personal work), the students will be able to communicate in spoken and written French, in a simple, but clear manner, on familiar topics in the context of study, hobbies etc. Another important goal of this course is to introduce the student to French culture.

At the end of the course, complete beginners can achieve an A1
level and some aspects of the A2 of The Common European Framework of Reference for Languages. More advanced students may aim for B1/B2 levels. Those who already completed the first year of the French course will be prepared for working in a French business environment.

Course contents

Two different tracks are proposed: track 1 for students newly arrived at Centrale Nantes and track 2 for students who have completed the first year of the French course. Track 1:
Full range of practical communication language exercises: reading comprehension, listening comprehension, written expression, oral expression.
Learners will be able to use the foreign language in a simple way for the following purposes:

1. Giving and obtaining factual information:
- personal information (e.g. name, address, place of origin, date of birth, education, occupation)
- non-personal information (e.g. about places and how to get there, time of day, various facilities and services, rules and regulations, opening hours, where and what to eat, etc.)

2. Establishing and maintaining social and professional contacts, particularly:
- meeting people and making acquaintances
- extending invitations and reacting to being invited
- proposing/arranging a course of action
- exchanging information, views, feelings, wishes, concerning matters of common interest, particularly those relating to personal life and circumstances, living conditions and environment, educational/occupational activities and interests, leisure activities and social life

3. Carrying out certain transactions:

- making arrangements (planning, tickets, reservations, etc.) for travel, accommodation, appointments, leisure activities
- making purchases
- ordering food and drink

Track 2:
This track follows on directly from the first-year French course, developing and completing the concepts studied thus far. The main themes are: housing, health and work. These topics will help prepare students for their future work environment. For example, housing is explored in the form of a search for accommodation upon arrival in a new city. Special workshops for CVs and cover letters, elevator pitches and job interviews.

Course material

Preparation manuals, our own tailor-made documents, written and televised press, internet, general civilization documents, digital tools, our own educational materials on Hippocampus (Moodle).

Sustainable Development Goals (SDGs) covered by this course

Quality education

Sustainable Development and Social Responsibility Positioning

Targeted competencies extracted from: Education for sustainable development goals, learning objectives (UNESCO) https: //unesdoc.unesco.org/ark:/48223/pf0000247507 https://www.coe.int/fr/web/common-european-framework-reference-languages/official-translations-of-the-cefr-global-scale

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	2	0 hrs	32 hrs	0 hrs	0 hrs	0 hrs

Master Thesis or Internship [THESIS]

LEAD PROFESSOR(S): Xavier TAUZIA

Requirements

depending upon internship topic

Objectives

- Be exposed to and adapt to an industrial or research environment
- Put in practice the scientific and technical skills acquired in the previous semesters
- Strengthen interpersonal and communication skills
- Be part of or manage a project
- Organize tasks, analyze results and build deliverables

Course contents

Students should be pro-active and career-oriented in the search for their thesis/internship. The topics are validated by the program supervisor to ensure an adequate Master level. The thesis/internship is evaluated through the submission of a written report and an oral defense.

Course material

- Turabian Kate Larimore, Booth Wayne Clayton, Colomb Gregory G., Williams Joseph M., & University of Chicago press. (2013). A manual for writers of research papers, theses, and dissertations: Chicago style for students and researchers (8th edition.). Chicago (Ill.) London: University of Chicago Press.
- Bui Yvonne N. How to Write a Master's Thesis. 2nd ed. Thousand Oaks, Calif: Sage, 2014.
- Evans David G., Gruba Paul, et Zobel Justin. How to Write a Better Thesis. 3rd edition. Carlton South, Vic: Melbourne University Press, 2011.

Sustainable Development Goals (SDGs) covered by this course

Affordable and clean energy / Climate action / Industry, innovation and infrastructure / Responsible consumption and production

Sustainable Development and Social Responsibility Positioning

The internship deals with topics related to sustainable development: clean and decarbonized energy, sustainable transport, renewable energies,...

Assessment

Individual assessment: EVI 1 (coefficient 1.0)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	30	0 hrs	0 hrs	0 hrs	0 hrs	0 hrs