

FOURTH YEAR – GM

Practical info

Location(s)





Improve your management abilities

ECTS 4 crédits



Introducing

Management I3CCGE51

Objectives

At the end of this module, the student will

¿ Know the legal environment and responsibilities of a business

activity

¿ Be able to objectively assess the financial health of a company and evaluate the rentability of an investment
¿ Realize a market diagnosis (benchmarking) and a business diagnosis in order to make decisions and set goals and strategies

 \dot{z} Collect the market data and put in action a business plan adapted to the means and goals of the company Module L 2

The objectives, defined in reference to the CEFRL for the 5 language activities, are specific for the language studied Chinese, German, Spanish \dot{c} and the level of the student.

They can be consulted on :

https://moodle.insatoulouse.fr/course/view.php?id=44

In certain cases, students may be authorised to follow an English module instead of another language

Practical info

Location(s)

Q Toulouse

Necessary prerequisites





Toulouse School of Management

Practical info

Location(s)





Multiphysics modeling



Hourly volume

Introducing



Toulouse

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- Lumped (OD/1D) and distributed (3D) parameters models for Multiphysic systems.

- Network approach for lumped parameters models, Acausal/causal concepts, bond graph, Finite Element Methods.

The student will be able to:

- Set up OD/1D (electrical, mechanical, hydraulical, thermal) and 3D models (mechanical) for mechatronics systems.

- Use OD/1D platforms such as : Dymola/Modeilca, AMESim, Simulink.

- Use 3D platforms such as : Patran/Nastran or Abaqus

Necessary prerequisites

Kirchhoff laws, electrocinetic, work/energy/power, pressure and hydrostatic, conduction/convection, heat transfer.

Strength of material for BSME.

Practical info







Modelling tools and Optimization



Hourly volume

Introducing

Linear Algebra, Differential Calculus, Probabilities, Dynamic systems, Basic concepts in propositional logics and in Petri Nets.

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- Various approaches to analyze and evaluate the performances of discrete event system DES,

- Various types of modelling adapted to the problems considered (deterministic or stochastic models ,

numerical and combinatorics optimization models, models of concurrency)

- Algorithms available to solve these problems.

The student will be able to:

Model and solve operational research problems (optimisation, linear programming, graphs, stochastic process) and discrete-event systems problems.

Model stochastic systems, such as a network of queues , using Markov chains. Compute their stationary performance measures, and dimension their capacity.

Model a DES by Petri net, analyse the properties of the Petri net by various methods of analysis (exhaustive and structural)

Practical info

Location(s)

Q Toulouse

Necessary prerequisites





Architectures or technological systems

Introducing

ECTS 7 crédits

interaction

Hourly volume

93h

- Propose an object-oriented UML model of a system

- Implement a technological solution on a mechatronic system

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

Power transmissions

-Needs for power, associated functions, power architectures in technological systems (mechanic, hydraulic, electric)

-The interest of system modeling, methods and tools,

Computer science & Electronics

- the interest to have a common modeling graphical language, the concepts relative to a object oriented approach.

- Industrial network introduction, interface eelctronics

The student will be able to:

Power transmissions

- identify and structure the power needs (supply, meter, distribute, transform, condition, manage, etc)

- analyse a schematic of a power system (mechanical, hydraulic, electric) at an architectural and functional level

- assess/list/compare solutions for implementing a given function of power transmission

- synthesize a power architecture (mechanical, electrical, electric) from functional needs

Computer science & Electronics

- how to choose the most appropriate diagrams depending on the approach: structure, behaviour,

Necessary prerequisites

Basic technological knowledge in mechanics, hydraulics, electrics

Practical info

Location(s)

Toulouse





Automatic control





Hourly volume

Introducing

Objectives

For GM students, this course is a practical extension of the continuous marking methods seen in the previous year.

Optional part for AE: Understand the basic principles and constraints of hardware in the loop (HIL) simulations.

All students follow the end of the UF which deals with numerical control techniques and methods.

The student will be expected to be able to:

- Model a discrete system or discretize a continuous system.

- Give the performance of a discrete system.

- Synthesize a discrete control following a specification (performance) and implement it.

Necessary prerequisites

- AE-SE : Feedback systems (I2MAAU11) Control and computer architecture (I3MAAU11) Control of Linear Time Invariant Systems (I3MAAU21)

- GM-IS : Dynamic Systems (I3ICDM11)

Practical info

Location(s)





Improving one's autonomy and building one's own professional project level 2 S7





Hourly volume 46h

Introducing

- ¿ Enrich your professional network
- \dot{c} Set development axes, objectives and action plans

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

Physical and Sports Activities

The student will be able to:

to list the problems to be solved:

¿ Know the Physical and Sports Activity (rules, meaning, roles, etc.),

 $\grave{}$ Design the objective of the project.

to organize:

 $\dot{\boldsymbol{\varepsilon}}$ Know the constraints, the resources, and the means available,

¿ Know how to choose and plan actions over time,

¿ Know how to get involved in the group and the project: know how to adapt, dare to stimulate action, know how to give up, propose, etc.

to regulate:

¿ Know how to observe,

 $\dot{\boldsymbol{\varepsilon}}$ Know how to carry out a balance sheet,

 $\dot{\boldsymbol{\varepsilon}}$ Know how to readjust the choices if necessary.

Individualized Professional Project

The student should be able to:

¿ Develop your professional vision and define a strategy.

¿ Customize, present and compare your project to professionals

Necessary prerequisites

Learning outcomes 1st, 2nd, 3rd year.

Practical info

Location(s)

오 Toulouse





Communication in organisations with LV2

Hourly volume

Introducing

ECTS

6 crédits

0

In certain cases, students may be authorised to follow an English module instead of another language

Objectives

Objectives:

At the end of this module, the student will have understood and be able to explain (main concepts):

-How to answer the demand of the civil society for technical and scientific information

-How to carry out critical analysis in order to give appropriate answers when questioned about such issues

-How to consider the circulation and content of information within the organizations in which they will be hired

The classes given in English will focus on the specific linguistic characteristics of the English used in scientific contexts in order for the students to understand and master them.

The students will also be made aware of the specificities of scientific English as relates to publications in his specific field of research.

Module L 2

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Necessary prerequisites

Necessary knowledge: For classes in English : understanding of scientific English

Practical info

Location(s)





FLE Summer school





Practical info

Location(s)





French I





Hourly volume

Practical info

Location(s)

• Toulouse





Improve your management abilities

ECTS 4 crédits

Hourly volume 45h

Introducing

Management I3CCGE51

Objectives

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¿ Realize a market diagnosis (benchmarking) and a business diagnosis in order to make decisions and set goals and strategies

 \dot{z} Collect the market data and put in action a business plan adapted to the means and goals of the company Module L 2

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Practical info

Location(s)

Q Toulouse

Necessary prerequisites





Political sciences semester 1





Hourly volume

Practical info

Location(s)





Improve your management abilities

ECTS 4 crédits

Hourly volume 45h

Introducing

Management I3CCGE51

Objectives

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Practical info

Location(s)

Q Toulouse

Necessary prerequisites





Toulouse School of Management

Practical info

Location(s)





Design of structures





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

The student will be able to:

Finite element module :

- Perform finite element analysis using a commercial finite element code (Abaqus for example) following the presented principles and good practice.

- Identify the features offered by these numerical tools and the associated potentialities.

- Create relevant models related to the target objectives.

- Analyse and postprocess the obtained results.

- Analyze the impact of the modeling assumptions.

- Assess the risks inherent to the wrong interpretation of the results.

Reliability and Design of experiments module :

- Apply to practical case analyses the basics of reliability

- Build a design of experiments for the modeling of a physical system from numerical or experimental data.

Mechanics of vibrations module :

- Develop a linear dynamic model of a mechanical structure: a lumped parameters model for a discrete elements structure, or a distributed parameters model for a continuous structure.

- Determine the vibrations of these structures undergoing transient or permanent excitation.

Bibliographic work module :

- Carry out a literature review and establish a state of the art on a research topic that will be developed in I4GMPJ21 formation unit.

This state of the art will present :

- past history (previous studies, de facto situation, necessity of research)

- the main results of these past studies

- The elements that could guide future work in UF I4GMPJ21.

Necessary prerequisites

Finite element module : Computer aided design (CAD) Finite element concepts.

Mechanics of vibrations module :

Basics in solid mechanics, strength of material, dynamic systems.

Practical info

Location(s)

Toulouse





Manufacture





Introducing

Mechanical characteristics of materials Resistance of materials: elasticity

Digital production chain: CAD, CAM, Post-processing, use of means of production, control

Objectives

The student will be able to:

Classify groups of manufacturing processes and understand the relationship between process and mechanical properties

Define the influencing parameter on cutting material Optimize a machining operation in HSM

Define a Production Management Approach

Design parts by casting / forge / folding

Define the advantages and limitations of additive manufacturing processes

Design and produce plastic parts using an additive manufacturing process

Know the different ways to get rough part and their costs and performance

Define a range of rough part and design the necessary tools

Practical info

Location(s)

Q Toulouse

Necessary prerequisites

CAM manufacturing technology Tolerance Manufacturing analysis





Power transmission case study





Introducing

Objectives

At the end of this module, the students will be able to analyse technical requirements related to the design of a gear reducer, create a design with the associated sizing calculations, present their solution by means of both a draft and a CAD model.

Necessary prerequisites

Fundamentals of mechanical design:

- basics of manufacturing (welding, machining)

- common clamping technology (key, splines, screws, etc.)

- pivot joints (rolling bearings joint design and sizing)

- basics of technical drawing

- calculating forces in a mechanical system (equilibrium laws)

- calculating stresses (torsion and bending of beams)

Practical info

Location(s)

Toulouse





FLE Summer school





Practical info

Location(s)





French I





Hourly volume

Practical info

Location(s)





Improving one's autonomy and building one's own professional project level 2 S7





Hourly volume 46h

Introducing

- ¿ Enrich your professional network
- \dot{c} Set development axes, objectives and action plans

Objectives

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Practical info

Location(s)

오 Toulouse





Political sciences semester 1





Hourly volume

Practical info

Location(s)





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Hourly volume

Practical info

Location(s)









Hourly volume

Practical info

Location(s)





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Hourly volume

Practical info

Location(s)









Hourly volume

Practical info

Location(s)









Hourly volume

Practical info

Location(s)





Advanced heat transferts and fluid flow

Hourly volume

Introducing

5 crédits

ECTS

6

Objectives

At the end of this course, the student should have understood and will be able to explain the basics allowing to approach a phenomenon involving real (viscous) fluids. He will be able to tackle situations involving more or less complex heat and mass transfers.

The student will also be able to conduct a numerical simulation with Ansys Fluent code.

Necessary prerequisites

Inviscid fluid dynamics (I3ICFT01 ¿ Fluid Mechanics 1)

Introduction to heat transfer (I3ICFT01 $\grave{\epsilon}$ heat Transfer 1)

Practical info

Location(s)





Materials, vibrations and advanced mechanical modeling

Hourly volume

100h

Introducing

ECTS

7 crédits

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Objectives

the end of this module, the student will have understood and be able to explain how works a prestressed (or preloaded) mechanical system, basis of fracture mechanics and computations of vibrations and transient dynamics

The student will be able to identify mechanical systems that are preloaded, discuss with a specialist of fracture mechanics and carry out a simulation of vibrations and transient dynamics.

Necessary prerequisites

Basis on mechanical design, materials and vibrations

Practical info

Location(s)

오 Toulouse

Non-contractual information





Research projects and sports





Introducing

Objectives

The module aims at giving the students a first experience with research through a tutored project in teams (2 to 4 students).

At the end of the module, the student will :

- know how to conduct a bibliography search, synthesise and cite it, for a given scientific topic;

- communicate with rigor in English, orally of through written documents to highlight the research activity performed;

- perform a simple research action in a team organization to generate scientific propositions, then implement and finally assess them

Necessary prerequisites

None

Practical info

Location(s)

Toulouse





Multidisciplinary industrial project

6 crédits

0

ECTS



Introducing

Objectives

At the end of this module, the student will have understood and be able to explain the main principles and definitions of quality management, the importance of health and safety at work, how to assess and prevent risks, eco-design and life-cycle analysis.

The student will be able to develop their capabilities in mechanical design in an industrial project.

Necessary prerequisites

Bacchelor in mechanical design

Practical info

Location(s)





French II





Hourly volume

Practical info

Location(s)

• Toulouse





Communication in organisations with LV2

Hourly volume

Introducing

6 crédits

ECTS

0

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Objectives

Objectives:

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Module L 2

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Necessary prerequisites

Necessary knowledge: For classes in English : understanding of scientific English

Practical info

Location(s)





Political sciences semestre 2





Hourly volume

Practical info

Location(s)





Systems Engineering processes





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts): What are the engineering processes to develop a system, how they must be implemented and managed in companies, what are the associated standards.

The student will be able to:

- define, capture, analyze and express the stakeholders
- needs
- transform the needs into requirements

- define several logical and physical solutions from the needs, evaluate them and choose one manage development processes

Practical info

Location(s)





Mechatronic project





Introducing

Basic of algorithmic

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- power and information channels of mechatronic systems

- the place of system simulation activities in the design cycle (V design cycle) of complex systems

- the principle of data acquisition with computers

The student will be able to:

- Establish models suitable for various engineering tasks during the design of mechatronic systems.

- Implement models in a system simulation environment and perform validation and verification tasks associated to the V design cycle.

- Specify and conduct model-in-the-loop and softwareinthe-loop activities for a complex system.

- Design the different elements of a simple data acquisition system

- Implement a graphical programming language dedicated to the acquisition (LabVIEW) $% \left(\left({{{\rm{AbV}}} \right)_{\rm{AbV}} } \right)$

- Perform a security analysis

- Perform a lifecycle analysis with a dedicated software

Necessary prerequisites

Basics of mechanics, electronics, heat transfer, and automation.

Practical info

Location(s)






Quality, security, environment and sports

Hourly volume

61h

Introducing

ECTS

4 crédits

0

Objectives

At the end of this module, the student will have understood and be able to explain the main principles and definitions of quality management, the importance of health and safety at work, how to assess and prevent risks, eco-design and life-cycle analysis.

The students will be able to develop their capabilities in eco design in a project related to mechatronics.

Sports:

The student will have to build a project with his team by:

- Taking into account everyone's skills,

- Seeking to enhance the strengths of each partner and compensate potential weaknesses.

- Analyzing the balance of power they will be confronted with.

Practical info

Location(s)





Dynamics of structures and control





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

Vibrations of mechanical systems and structures.

Controlling the articulated systems and flexible structures.

The global and local modelling of electromagnetic actuators.

Necessary prerequisites

Basis in electromagnetism, solid mechanics and control

Practical info

Location(s)





Object-Oriented and Real-Time Programming

50h

Hourly volume

Introducing

ECTS

3 crédits

0

Objectives

This module consists of two parts:

- The part on real time systems introduces real time systems, key concepts, applications, constraints, and teaches the programming of these systems using the services of real time operating systems.

-At the end of the object programming part, students will be able to produce C++ code from a UML class diagram with relationships, inheritance and polymorphism.

Practical info

Location(s)





Research Initiating Project





Hourly volume

Introducing

Objectives

The module aims at motivating students with research activities through a selection of tutored projects. Each project involves a team of 6 students tutored by a researcher or an industrial partner. Those projects also benefit from a preliminary training on documentary research techniques to facilit the writing of a state-oftheart review of the domain. A course to project management techniques is also provided to guide students during the realisation phase of the project.

At the end of this module, the student wil have a practical experience of the following activities :

- identify a bibliography on a given topic, and present it through a standard formulation (IEEE form).

- write a state-of-the-art synthesis.

- precise the perimeter of the realization phase.

- apply project management and collaborative work techniques.

- write a projectif report and prepare a presentation in english for its project defense.

Practical info

Location(s)





Communication in organisations with LV2

Hourly volume

Introducing

ECTS

6 crédits

0

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Objectives

Objectives:

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-How to answer the demand of the civil society for technical and scientific information

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-How to consider the circulation and content of information within the organizations in which they will be hired

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Necessary prerequisites

Necessary knowledge: For classes in English : understanding of scientific English

Practical info

Location(s)





French II





Hourly volume

Practical info

Location(s)

• Toulouse





Political sciences semestre 2





Hourly volume

Practical info

Location(s)





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Hourly volume

Practical info

Location(s)









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Location(s)









Hourly volume

Practical info

Location(s)









Hourly volume

Practical info

Location(s)





Engineering 1





Practical info

Location(s)

• Toulouse





[FRANCAIS] Transmission mécanique

Hourly volume

140h

Introducing

ECTS

6 crédits

A

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts): Electrical power transfer and transformation.

The student will be able to:

Calculate electrical powers (DC/AC), induction in magnetic network, Laplace force in electrical machines.

Necessary prerequisites

Practical info

Location(s)





Innovation and Mechatronics





Introducing



Objectives

At the end of this module, the student will have understood and be able to explain (main concepts): -the basic and the key benchmarks regarding industrial property

-the role of the industrial property in the research and development approach and the process of innovation -the terminology, the basic notions of the patents law

The student will be able to:

-Identify the information contained in a patent

-Get acquainted in the searches for anteriority and in the use of databases patent (Espacenet)

-Build basic requests to verify the state of the technique

-Put into practice the use of the property industrial as strategic tool for an innovative company

-Make decisions concerning industrial property : legal elements, diversity of the strategic choices, financial stakes, partnership agreements, damages of the counterfeiting

-Develop a strategy of protection of an innovation

Practical info

Location(s)





Conduct a meeting





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

ENGLISH (25 teaching hours) The main characteristics of business English, and specialised English The skills required to pass the TOEIC test

CONDUCT A MEETING (15 hours teaching hours) At the end of this module, the student will have understood and be able to explain (main concepts):

- Different types of meetings.
- The role of the chairperson
- The different stages of a meeting
- How to put it all together
- -The principles of the interpersonal communication.
- The golden rules of group participation
- Managing stress and emotions
- Written summaries, briefs and reports

The student will be able to: ENGLISH

- Communicate with English speakers (written and spoken English) in a professional context

- Deal with professional issues in relations with their specialization (written and spoken English)

- Understand written and spoken documents in relation with business life (TOEIC)

CONDUCT A MEETING

- Chairing a meeting efficiently from a management position

- Defining objectives and adapting the approach

- Applying his/her knowledge and personal approach to highlight his/her savoir faire and savoir être.

- Adopting the role of chairperson whilst insuring group dynamics.

- Creating varied visual documents

Necessary prerequisites

ENGLISH: B1 level minimum

CONDUCT A MEETING: none

Practical info

Location(s)





Apprenticeship 5





Hourly volume

Introducing

Objectives

The apprentice should be able to:

- integrate and adapt to the company's project
- get involved in the work (initiatives, deepening)
- solve open industrial problems
- learn on their own.

Practical info

Location(s)



Apprenticeship 6





Introducing

Objectives

The apprentice should be able to

- define an innovative project for the company

Beyond the technical achievement, the apprentice must also be able to:

- define the characteristics of a project and the challenges of project management, deal with the management of deadlines, costs, quality, human resources, communication, risks and purchases, present the techniques for conducting meeting.

- Put into practice the use of industrial property as a strategic tool for an innovative company

Practical info

Location(s)







Fluids Mechanics and Heat transfert 2





Practical info

Location(s)





Mechanical Vibrations





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts): - fundamentals of control engineering for linear systems in time and frequency domains

The student will be able to:

- by means of computer tools, design a controller that ensures a set of performance requirements for a given process

Practical info

Location(s)





Hydraulic machines and Combustion Engineering





Hourly volume 50h

Practical info

Location(s)





Improve your management abilities

Introducing

ECTS 4 crédits

LAW: None

Hourly volume

44h

FINANCIAL MANAGEMENT: Studied the « accountancy and financial analysis course »

Objectives

ENGLISH

At the end of this module, the student will be able to:

* Understand and summarise technical documents in English (written and oral) linked to mechanical engineering

* Learn and apply technical vocabulary linked to mechanical engineering

* Present a technical subject in mechanical engineering

MARKETING, LAW, FINANCE

¿ Know the legal environment and responsibilities of a business activity

¿ Be able to objectively assess the financial health of a company and evaluate the rentability of an investment
¿ Conduct a market diagnosis (benchmarking) and a business diagnosis in order to make decisions and set goals and strategies

¿ Collect market data and put into action a business plan adapted to the means and goals of the company

Necessary prerequisites

ENGLISH: B1 level minimum

WORKING RELATIONS WITH ANGLO/AMERICANS: None

Practical info

Location(s)





Apprenticeship 7





Introducing

Objectives

The apprentice should be able to

- get involved in the company's project
- solve open industrial problems
- plan and manage your work
- team working
- open up to other technological fields.

Practical info

Location(s)





Apprenticeship 8





Introducing

Objectives

- Active skills ¿ Students work on a case study prepared by the teacher. (main aspects: service provider with a growing market, requiring a larger network of agencies to develop capital)

- work groups (teams of 2 or 3 members)
- Elaboration of an economical report to be shown and commented on in front of a share holders commitee
- Discussions with trainer during course
- Use of a business plan software

Practical info

Location(s)





Design of structures





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

The student will be able to:

Finite element module :

- Perform finite element analysis using a commercial finite element code (Abaqus for example) following the presented principles and good practice.

- Identify the features offered by these numerical tools and the associated potentialities.

- Create relevant models related to the target objectives.

- Analyse and postprocess the obtained results.

- Analyze the impact of the modeling assumptions.

- Assess the risks inherent to the wrong interpretation of the results.

Reliability and Design of experiments module :

- Apply to practical case analyses the basics of reliability

- Build a design of experiments for the modeling of a physical system from numerical or experimental data.

Mechanics of vibrations module :

- Develop a linear dynamic model of a mechanical structure: a lumped parameters model for a discrete elements structure, or a distributed parameters model for a continuous structure.

- Determine the vibrations of these structures undergoing transient or permanent excitation.

Bibliographic work module :

- Carry out a literature review and establish a state of the art on a research topic that will be developed in I4GMPJ21 formation unit.

This state of the art will present :

- past history (previous studies, de facto situation, necessity of research)

- the main results of these past studies

- The elements that could guide future work in UF I4GMPJ21.

Necessary prerequisites

Finite element module : Computer aided design (CAD) Finite element concepts.

Mechanics of vibrations module :

Basics in solid mechanics, strength of material, dynamic systems.

Practical info

Location(s)





Manufacture



Hourly volume 64h

Introducing

Mechanical characteristics of materials Resistance of materials: elasticity

Digital production chain: CAD, CAM, Post-processing, use of means of production, control

Objectives

The student will be able to:

Classify groups of manufacturing processes and understand the relationship between process and mechanical properties

Define the influencing parameter on cutting material Optimize a machining operation in HSM

Define a Production Management Approach

Design parts by casting / forge / folding

Define the advantages and limitations of additive manufacturing processes

Design and produce plastic parts using an additive manufacturing process

Know the different ways to get rough part and their costs and performance

Define a range of rough part and design the necessary tools

Practical info

Location(s)

• Toulouse

Necessary prerequisites

CAM manufacturing technology Tolerance Manufacturing analysis





Power transmission case study





Introducing

Objectives

At the end of this module, the students will be able to analyse technical requirements related to the design of a gear reducer, create a design with the associated sizing calculations, present their solution by means of both a draft and a CAD model.

Necessary prerequisites

Fundamentals of mechanical design:

- basics of manufacturing (welding, machining)

- common clamping technology (key, splines, screws, etc.)

- pivot joints (rolling bearings joint design and sizing)

- basics of technical drawing

- calculating forces in a mechanical system (equilibrium laws)

- calculating stresses (torsion and bending of beams)

Practical info

Location(s)





Improving one's autonomy and building one's own professional project level 2 S7





Introducing

- ¿ Enrich your professional network
- \dot{c} Set development axes, objectives and action plans

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

Physical and Sports Activities

The student will be able to:

to list the problems to be solved:

¿ Know the Physical and Sports Activity (rules, meaning, roles, etc.),

 $\grave{}$ Design the objective of the project.

to organize:

 $\dot{\boldsymbol{\varepsilon}}$ Know the constraints, the resources, and the means available,

¿ Know how to choose and plan actions over time,

¿ Know how to get involved in the group and the project: know how to adapt, dare to stimulate action, know how to give up, propose, etc.

to regulate:

¿ Know how to observe,

 $\dot{\boldsymbol{\varepsilon}}$ Know how to carry out a balance sheet,

 $\dot{\boldsymbol{\varepsilon}}$ Know how to readjust the choices if necessary.

Individualized Professional Project

The student should be able to:

¿ Develop your professional vision and define a strategy.

¿ Customize, present and compare your project to professionals

Necessary prerequisites

Learning outcomes 1st, 2nd, 3rd year.

Practical info

Location(s)





[FRANCAIS] Formation Continue Tutorat Spécifique GM S1 CT1

Practical info

Location(s)





Métallurgie transfert thermique

Practical info

Location(s)





Improve your management abilities

ECTS 4 crédits

Hourly volume 45h

Introducing

Management I3CCGE51

Objectives

At the end of this module, the student will

¿ Know the legal environment and responsibilities of a business

activity

¿ Be able to objectively assess the financial health of a company and evaluate the rentability of an investment
¿ Realize a market diagnosis (benchmarking) and a business diagnosis in order to make decisions and set goals and strategies

 \dot{z} Collect the market data and put in action a business plan adapted to the means and goals of the company Module L 2

The objectives, defined in reference to the CEFRL for the 5 language activities, are specific for the language studied Chinese, German, Spanish \dot{c} and the level of the student.

They can be consulted on :

https://moodle.insatoulouse.fr/course/view.php?id=44

In certain cases, students may be authorised to follow an English module instead of another language

Practical info

Location(s)

Q Toulouse

Necessary prerequisites





Advanced heat transferts and fluid flow

Hourly volume

Introducing

5 crédits

ECTS

6

Objectives

At the end of this course, the student should have understood and will be able to explain the basics allowing to approach a phenomenon involving real (viscous) fluids. He will be able to tackle situations involving more or less complex heat and mass transfers.

The student will also be able to conduct a numerical simulation with Ansys Fluent code.

Necessary prerequisites

Inviscid fluid dynamics (I3ICFT01 ¿ Fluid Mechanics 1)

Introduction to heat transfer (I3ICFT01 $\grave{\epsilon}$ heat Transfer 1)

Practical info

Location(s)





Materials, vibrations and advanced mechanical modeling

Hourly volume

100h

Introducing

ECTS

7 crédits

a

Objectives

the end of this module, the student will have understood and be able to explain how works a prestressed (or preloaded) mechanical system, basis of fracture mechanics and computations of vibrations and transient dynamics

The student will be able to identify mechanical systems that are preloaded, discuss with a specialist of fracture mechanics and carry out a simulation of vibrations and transient dynamics.

Necessary prerequisites

Basis on mechanical design, materials and vibrations

Practical info

Location(s)

오 Toulouse





Research projects and sports





Introducing

Objectives

The module aims at giving the students a first experience with research through a tutored project in teams (2 to 4 students).

At the end of the module, the student will :

- know how to conduct a bibliography search, synthesise and cite it, for a given scientific topic;

- communicate with rigor in English, orally of through written documents to highlight the research activity performed;

- perform a simple research action in a team organization to generate scientific propositions, then implement and finally assess them

Necessary prerequisites

None

Practical info

Location(s)





Multidisciplinary industrial project

6 crédits

0

ECTS



Introducing

Objectives

At the end of this module, the student will have understood and be able to explain the main principles and definitions of quality management, the importance of health and safety at work, how to assess and prevent risks, eco-design and life-cycle analysis.

The student will be able to develop their capabilities in mechanical design in an industrial project.

Necessary prerequisites

Bacchelor in mechanical design

Practical info

Location(s)





French II





Hourly volume

Practical info

Location(s)

• Toulouse




Communication in organisations with LV2

Hourly volume

Introducing

ECTS

6 crédits

0

In certain cases, students may be authorised to follow an English module instead of another language

Objectives

Objectives:

At the end of this module, the student will have understood and be able to explain (main concepts):

-How to answer the demand of the civil society for technical and scientific information

-How to carry out critical analysis in order to give appropriate answers when questioned about such issues

-How to consider the circulation and content of information within the organizations in which they will be hired

The classes given in English will focus on the specific linguistic characteristics of the English used in scientific contexts in order for the students to understand and master them.

The students will also be made aware of the specificities of scientific English as relates to publications in his specific field of research.

Module L 2

The objectives, defined in reference to the CEFRL for the 5 language activities, are specific for the language studied ¿ Chinese, German, Spanish ¿ and the level of the student.

They can be consulted on : https://moodle.insatoulouse.fr/course/view.php?id=44

Necessary prerequisites

Necessary knowledge: For classes in English : understanding of scientific English

Practical info

Location(s)





Political sciences semestre 2





Hourly volume

Practical info

Location(s)





Advanced heat transferts and fluid flow

Hourly volume

Introducing

5 crédits

ECTS

6

Objectives

At the end of this course, the student should have understood and will be able to explain the basics allowing to approach a phenomenon involving real (viscous) fluids. He will be able to tackle situations involving more or less complex heat and mass transfers.

The student will also be able to conduct a numerical simulation with Ansys Fluent code.

Necessary prerequisites

Inviscid fluid dynamics (I3ICFT01 ¿ Fluid Mechanics 1)

Introduction to heat transfer (I3ICFT01 $\grave{\epsilon}$ heat Transfer 1)

Practical info

Location(s)





Materials, vibrations and advanced mechanical modeling

Hourly volume

100h

Introducing

ECTS

7 crédits

a

Objectives

the end of this module, the student will have understood and be able to explain how works a prestressed (or preloaded) mechanical system, basis of fracture mechanics and computations of vibrations and transient dynamics

The student will be able to identify mechanical systems that are preloaded, discuss with a specialist of fracture mechanics and carry out a simulation of vibrations and transient dynamics.

Necessary prerequisites

Basis on mechanical design, materials and vibrations

Practical info

Location(s)

오 Toulouse





Multidisciplinary industrial project





Introducing

Objectives

At the end of this module, the student will have understood and be able to explain the main principles and definitions of quality management, the importance of health and safety at work, how to assess and prevent risks, eco-design and life-cycle analysis.

The student will be able to develop their capabilities in mechanical design in an industrial project.

Necessary prerequisites

Bacchelor in mechanical design

Practical info

Location(s)





Research projects and sports





Introducing

Objectives

The module aims at giving the students a first experience with research through a tutored project in teams (2 to 4 students).

At the end of the module, the student will :

- know how to conduct a bibliography search, synthesise and cite it, for a given scientific topic;

- communicate with rigor in English, orally of through written documents to highlight the research activity performed;

- perform a simple research action in a team organization to generate scientific propositions, then implement and finally assess them

Necessary prerequisites

None

Practical info

Location(s)

Toulouse





Tutorat Spécifique GM S2 CT1

Practical info

Location(s)

