

CONTINUING EDUCATION_CT1 MECHANICAL ENGINEERING

Practical info

Location(s)

 Toulouse

Design of structures



ECTS
7 crédits



Hourly volume
79h

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



ECTS
6 crédits



Hourly volume
64h

Introducing

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

Mechanical characteristics of materials
Resistance of materials: elasticity

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

Practical info

Location(s)

 Toulouse

Necessary prerequisites

CAM manufacturing technology
Tolerance Manufacturing analysis

Power transmission case study



ECTS

9 crédits



Hourly volume

107h

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

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



ECTS
4 crédits



Hourly volume
46h

Introducing

- ¿ Enrich your professional network
- ¿ 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.),

¿ Design the objective of the project.

to organize:

¿ 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,

¿ Know how to carry out a balance sheet,

¿ 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)

 Toulouse

[FRANCAIS] Formation Continue Tutorat Spécifique GM S1 CT1

Practical info

Location(s)

 Toulouse

Métallurgie transfert thermique

Practical info

Location(s)

 Toulouse

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

¿ 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 CEFR 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.insa-toulouse.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)



Toulouse

Necessary prerequisites

Advanced heat transferts and fluid flow



ECTS
5 crédits



Hourly volume

Introducing

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 & heat Transfer 1)

Practical info

Location(s)



Toulouse

Materials, vibrations and advanced mechanical modeling



ECTS
7 crédits



Hourly volume
100h

Introducing

Objectives

the end of this module, the student will have understood and be able to explain how works a pre-stressed (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)

 Toulouse

Research projects and sports



ECTS

6 crédits



Hourly volume

2h

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 or 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



ECTS
6 crédits



Hourly volume
85h

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

Bachelor in mechanical design

Practical info

Location(s)

 Toulouse

French II



ECTS
3 crédits



Hourly volume

Practical info

Location(s)



Toulouse

Communication in organisations with LV2



ECTS

6 crédits



Hourly volume

Introducing

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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<https://moodle.insa-toulouse.fr/course/view.php?id=44>

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

Necessary prerequisites

Necessary knowledge:

For classes in English : understanding of scientific English

Practical info

Location(s)

 Toulouse

Political sciences semestre 2



ECTS
3 crédits



Hourly volume

Practical info

Location(s)



Toulouse

Advanced heat transferts and fluid flow



ECTS
5 crédits



Hourly volume

Introducing

Objectives

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

Necessary prerequisites

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Introduction to heat transfer (I3ICFT01 & heat Transfer 1)

Practical info

Location(s)



Toulouse

Materials, vibrations and advanced mechanical modeling



ECTS
7 crédits



Hourly volume
100h

Introducing

Objectives

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Necessary prerequisites

Basis on mechanical design, materials and vibrations

Practical info

Location(s)



Toulouse

Multidisciplinary industrial project



ECTS
6 crédits



Hourly volume
85h

Introducing

Objectives

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

Necessary prerequisites

Bachelor in mechanical design

Practical info

Location(s)

 Toulouse

Research projects and sports



ECTS

6 crédits



Hourly volume

2h

Introducing

Objectives

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- communicate with rigor in English, orally or 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)

 Toulouse