

5th YEAR GM -MECHANICAL ENGINEERING COURSES_SEMESTER 9

Practical info

Location(s)

 Toulouse

System level modelling and simulation



ECTS
3 crédits



Hourly volume
29h

Introducing

Objectives

The student will be able to model, simulate and analyse multi-domain power systems

Necessary prerequisites

Dynamic systems, fluid mechanics, solid rigid mechanics.

Practical info

Location(s)

 Toulouse

Composite structures and case study



ECTS
3 crédits



Hourly volume
46h

Introducing

Objectives

The student will be able to perform simple sizing of composite structures and to choose a couple manufacturing/material for a given case study.

The student will be able to:

- Choice a couple of fibers and matrix and their commercial products.
- Choice a type of composite architecture: laminates, sandwiches, 2D1/2,3D, 4D.
- Determine the manufacturing method: hand layup, fiber placement, RTM, LRI, RFI.
- To be inspired by solutions of automotive, naval, wind energy or aerospace industry.
- To be inspired by past experience in aeronautic industry.
- Know and use laminate theory.
- Knows and use simple sizing of junctions.
- Know issues of impact and ageing.
- Know issues of failure and damage.
- Realize a case study: example wing box of an acrobatic aircraft
- Make a presentation of their sizing and their design.
- Work in a collaborative manner.

Necessary prerequisites

Beam theory, continuum mechanics, materials

behaviors.

Matrix Calculation

Practical info

Location(s)

 Toulouse

Heat Engines, Refrigerators and Heat Pumps



ECTS
3 crédits



Hourly volume
38h

Introducing

Objectives

At the end of this course, the student should have understood and will be able to explain the operation of conventional heat engines, refrigerators and heat pumps as well as the basics of combustion

The student should be able to size and optimize conventional heat engines, refrigerators and heat pumps

Necessary prerequisites

Fundamentals in thermodynamics (1st year)
Thermodynamics and Thermodynamic Analysis (1st year)

Practical info

Location(s)

 Toulouse

Non destructive testing – English



ECTS
4 crédits



Hourly volume
20h

Introducing

Objectives

Module 1 : Non Destructive testing (NDT)

Students have to know the main nondestructive testing methods with advantages/drawbacks and how to apply them to practical industrial cases. They must be able to choose the most appropriate method to solve specific industrial issues.

Module 2 : Metallic alloys for high temperature applications & Creep behaviour

Analysis of the physics occurring during creep and of the parameters which affect creep resistance.

How to apply basic theoretical models to calculate rupture life expectancy.

Knowledge of the main metallic alloys withstanding creep at high temperatures.

Module 3 : English

Students must be able to organize their scientific speech and writing logically, to use proper English in a concise and appropriate style while meeting genre conventions; master technical terms; resort to appropriate registers (specialized/non specialized audiences/readers) and quote scientific sources according to international citation standards.

Module 1: Nondestructive testing (NDT)

L1, 2 and 3 courses or equivalent: knowledge of fundamental principles in physics i.e. electricity, electromagnetism, optics, atomic structure and Materials Science.

Module 2 : Metallic alloys for high temperature applications & Creep behaviour

Mechanics of Materials: defects in metallic materials and plastic deformation mechanisms; behaviour of materials

Module 3 : English

Students must master general English and know how to write and talk about general scientific elements in a rigorous way (1st, 2nd, 3rd & 4th year English courses).

Practical info

Location(s)

 Toulouse

Necessary prerequisites

Research project part II



ECTS

4 crédits



Hourly volume

7h

Introducing

Location(s)

 Toulouse

Objectives

The module is aimed at motivating students with research activities by means of a tutored projects involving groups of several students and directed by an academic or an industrial tutor.

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

- the concepts and techniques in relationship with the management of the research project involving several persons.

The student will be able to:

- finalize a research project involving several persons,
- integrate scientific approaches and techniques of different scientific domains to meet the realization goals of the research project

Necessary prerequisites

A final report

Practical info

Optional modulus



ECTS
7 crédits



Hourly volume
30h

Introducing

Objectives

The student will be able to successfully follow 3 optional modules related to mechanical design skills

Practical info

Location(s)



Toulouse

Human relations



ECTS

6 crédits



Hourly volume

78h

Introducing

Location(s)

 Toulouse

Objectives

L'étudiant devra être capable de :

- Analyser des situations de groupe avec des concepts issus de la psychologie sociale
- Identifier les dimensions éthiques de ces situations et prendre position
- Repérer et comprendre des informations liées aux RH
- Analyser une situation de management d'équipe en référence à un cadre théorique
- Formuler et argumenter des solutions managériales
- Agir dans un milieu naturel : analyser, décider, agir ; mettre en œuvre la sécurité, utiliser du matériel spécifique. découvrir un site.
- Respecter et s'intégrer dans un environnement différent de ses habitudes
- S'engager avec cohérence dans le projet d'activités
- Prendre part activement au collectif
- Valider son projet professionnel et construire une stratégie pour trouver un emploi

Necessary prerequisites

None

Practical info