

2nd YEAR IC_SEMESTER 3 INSA

Practical info

Location(s)

 Toulouse

Mathematical theory applied to mechanics

 **ECTS**
7 crédits

 **Hourly volume**
80h

Introducing

Modulus I1ANMAAR, I1ANMATC, I1ANMAEF, et I1ANMAAL of mathematics of first year.

Objectives

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

Theoretical Part

Norms and scalar product on \mathbb{R}^n

Properties of special matrices (symetric matrices, projection matrices, orthogonal matrices).

Continuity and derivation on \mathbb{R}^n (partial derivatives, jacobian and gradients, chain rule)

Taylor's expansion

Critical points of a function of several variables

Integration on domains of \mathbb{R}^n , with dedicated techniques (Fubini, change of variable) and applications (computation of volumes, averages, centers of gravity).

Numerical Part (Numerical Analysis)

Numerical errors, conditioning numbers

Methods to compute numerically integrals

Methods to solve nonlinear equations and linear systems

Method of the Lagrange interpolating polynomial

Least-squares method.

Practical info

Location(s)

 Toulouse

Necessary prerequisites

Mechanics, network and electric machines

 ECTS
7 crédits

 Hourly volume
73h

Practical info

Location(s)

 Toulouse

Science of materials



ECTS
3 crédits



Hourly volume
38h

Practical info

Location(s)

 Toulouse

Industrial Sciences – Computer Aided Design

 ECTS
6 crédits

 Hourly volume

Practical info

Location(s)

 Toulouse

Company knowledge and communication

 **ECTS**
5 crédits

 **Hourly volume**
75h

Introducing

Objectives

Objectives:

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

- how to give an oral presentation
- some of the historical, geographical and/or geopolitical aspects of different English-speaking socio-cultural contexts
- how to produce a structured written synthesis in French.
- how to write a training period report and present it orally
- inner workings of contemporary economy and interdependence of macroeconomic scales

The student will be able to:

In French

- write the synthesis of a set of press articles and present it orally with Powerpoint visual aids
- write a training period report and give an oral presentation describing a particular company, reporting on and analysing a work experience.

In English:

- give a Powerpoint oral presentation in front of a group and orally interact with the audience
- demonstrate creativity, initiative and open mindedness in teamwork

- develop a thorough knowledge and a critical mind about different English-speaking socio-cultural contexts, taking into account historical, geographical and/or geopolitical considerations.

In Economics :

- understand current major economic and societal stakes
- discuss and debate using arguments grounded in the knowledge of fundamental economic mechanisms and some economic thinking theories

Necessary prerequisites

Expression 1 in the first-year « Grand Domaine Humanités » (D1ANHU01)

Writing and oral skills in English in the first-year « Grand Domaine Humanités » (D1ANHU01)

Practical info

Location(s)

 Toulouse

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

 ECTS
2 crédits

 Hourly volume
44h

Practical info

Location(s)

 Toulouse

Refresher course 2nd year

 ECTS

 Hourly volume
162h

Practical info

Location(s)

 Toulouse