INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

SEMESTER 7_4th YEAR GPE

Practical info

Location(s)

Toulouse

Improve your management abilities

ECTS
4 crédits

Hourly volume
45h

Management I3CCGE51

Introducing

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 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.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

Practical info

Location(s)

Toulouse

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES TOULOUSE

Toulouse School of Management

Practical info

Location(s)

Toulouse

Unit operations 1

ECTS
5 crédits

Hourly volume
56h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
- the basic concepts concerning intermolecular and interfacial interactions
- Different ways to perform filtration processes
- basic concepts of deep-bed filtration and membrane separation (UF/MF/NF)
- dimensionless numbers to characterise physical phenomena involved in mixing and separation operations
- design tools for unit operation of filtration and mixing

The student will be able to:
- identify interactions between compounds or interface/ compounds involved in filtration and mixing operations
- identify main membrane fouling phenomena for a given
application
- operate some filtration units at lab or pilot scale
--select the required unit operation and technology for a filtration or a mixing operation
- write the mass balances
- design a deep-bed filter
- design a membrane operation (MF, UF, NF)
- design a stirred tank and a static mixer

Necessary prerequisites

Hydraulics and dispersed systems (I3BETF21)
Fluid properties (I3BEPF12)
Heat and mass transfer (I3BETF32)
Thermodynamics
Basic concepts of Chemistry and Physics

Practical info

Location(s)

Toulouse

Unit operations 2

ECTS
5 crédits

Hourly volume
83h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
- Phase equilibrium diagrams
- General concept for mass transfer unit operations (Ideal stages, operating linesż). Kinetic limitations and theirs effects on separation
- Different ways to perform separation processes (single contact, cross-current and counter-current contactors)
- design tools for separators.

The student will be able to:
- use the equilibrium diagrams
- choose the required technology for a separation
- choose the contact mode
- write the mass balance
- design a multistage separation device (extraction, distillation, adsorption, absorptionż)
- then propose a contactor technology.

Necessary prerequisites

Hydraulics and dispersed systems (I3BETF21)
Fluid properties (I3BEPF12)
Heat and mass transfer (I3BETF32)
Thermodynamics

Basic concepts of Chemistry and Physics

Practical info

Location(s)

Toulouse

Processes simulation and analysis

ECTS
5 crédits

Hourly volume
73h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):
- the basics of chemical engineering process simulation tools at various scales
- the life cycle and carbon balance principles
- the basics of multidimensional analysis
- the elementary notions about process optimisation

The student will be able to:
- select the appropriate simulation tool with respect to the scale of investigation
- synthesize their knowledge to analyze the results of a commercial simulation tool
- simulate industrial processes in steady state
- perform the Life Cycle Analysis of an existing process
- use the FLUENT software to simulate single phase flows
- use the PROSIM Plus software to simulate general steady state processes
- use the UMBERTO software to perform a global analysis of a process within its environment.
- gather knowledge from various fields to choose the modelling approach, perform the set-up of the simulation and analyse the results
- perform an optimisation study with PROSIM
- set up simulations of unsteady state processes with PROSIM Batch and FLUENT

Necessary prerequisites

Modelling and numerical methods for transport phenomena (momentum, mass and energy) and thermodynamics
Basic concepts for Unit Operation
Technology and design of Unit Operation
Hydraulic and dispersed systems
Transport and reaction in fluid medium

Practical info

Location(s)

Toulouse

Chemical and environmental engineer, define and build a project

ECTS
5 crédits

Hourly volume
79h

Practical info

Location(s)

Toulouse

Heterogeneous reaction engineering

ECTS
5 crédits

Hourly volume
37h

Introducing

Objectives

Know and explain the concepts of
- chemical catalysts
- heterogeneous reaction mechanisms and associated kinetic laws
- limiting step(s) in heterogeneous reactions
- apparent (overall) reaction rate
- dimensionless numbers (Hatta, Biot, Thiele, Weiss)
- effectiveness factor and enhancement factor

Establish an intrinsic kinetic law
Determine the limiting process(es) in a heterogeneous chemical reaction
Express dimensionless numbers used in heterogeneous reactions (Hatta, Biot, Thiele, Weisz) and explain their meaning
Express the apparent global rate of a chemical reaction depending on the working conditions
Select and design the most suitable reactor to perform a given reaction
Integrate and prioritize the mechanisms in order to model heterogeneous chemical reactors (batch or continuous)

Necessary prerequisites

Chemical reaction Engineering I (I2BERR12)
Chemical reaction Engineering II (I3BERR12)
Heat and mass transfer (I3BETF32)

Thermodynamics (I2BETH11)
Fluid properties (I3BEPF12)

Practical info

Location(s)

Toulouse

Political sciences semester 1

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
1 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
2 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
3 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
4 crédits

Hourly volume

Practical info

Location(s)

Toulouse

[FRANCAIS] Challenge – Formation ECIU

ECTS
5 crédits

Hourly volume

Practical info

Location(s)

Toulouse