UNIVERSITÉ TOULOUSE III PAUL SABATIER

Faculté Sciences et Ingénierie

PÉRIODE D'ACCRÉDITATION : 2022 / 2026

UNIVERSITÉ PAUL SABATIER

SYLLABUS MASTER

Mention Génie des procédés et des bio-procédés

M1 GPBP Membrane Engineering for Sustainable Development

http://www.fsi.univ-tlse3.fr/
http://www.univ-tlse3.fr/master-mention-genie-des-procedes-et-des-bio-procedes-2016-2021-619280.kjsp?RH=1454074064222

2024 / 2025

1er AVRIL 2025

SUMMARY OF THE CONTENT

PRESENTATION OF THE DISCIPLINE

DISCIPLINE GÉNIE DES PROCÉDÉS ET DES BIO-PROCÉDÉS

The **Process and Bioprocess Engineering Master** aims at providing the students with a scientific formation in the field of physicochemical processes that will make them capable to design, study and master energy and mass conversion processes and to control the quality and properties of end products. Theoretical and practical courses afford the students scientific and technical expertise in order to facilitate their immediate employment entry or to apply for a PhD position. The qualification opens up many prospects in the following areas of activity : chemistry, food industry, materials conception, pharmacy or health engineering. Work positions are also reachable in technical offices devoted to environment or energy consumption control.
The master offers three different trainings :
- Physico-Chemical Processes for Chemistry, Environment and Energy (PCE2)
- Processes for Production and Control of Health Products (PPQPS)
- Erasmus Mundus Master on Membrane Engineering (EM3E)

PRESENTATION OF THE YEAR OF M1 GPBP MEMBRANE ENGINEERING FOR SUSTAINABLE DEVELOPMENT

CONTACTS SECTION

CONTACT INFORMATION CONCERNING THE SPECIALTY

PERSON IN CHARGE OF TEACHING AFFAIRS OF M1 GPBP MEMBRANE ENGINEERING FOR SUSTAINABLE DEVELOPMENT

HALLEZ Yannick
Email : yannick.hallez@univ-tlse3.fr Téléphone : 05 61 55 60 64

REMIGY Jean-Christophe
Email : jean-christophe.remigy@univ-tlse3.fr Téléphone : 7618

SECRETARY OF STUDENT AFFAIRS OF

DALL' AGLIO COR Aude
Email : aude.dall-aglio-cor@univ-tlse3.fr Téléphone : 0561556207

CONTACT INFORMATION CONCERNING THE DISCIPLINE

PERSON IN CHARGE OF THE DISCIPLINE GÉNIE DES PROCÉDÉS ET DES BIO-PROCÉDÉS

REMIGY Jean-Christophe
Email : jean-christophe.remigy@univ-tlse3.fr Téléphone : 7618

CONTACT INFORMATION FOR THE DEPARTMENT : FSI.CHIMIE

HEAD OF DEPARTMENT

JOLIBOIS Franck
Email : franck.jolibois@univ-tlse3.fr Téléphone : 0561559638

DEPARTMENT SECRETARY

TEDESCO Christine
Email : christine.tedesco@univ-tlse3.fr Téléphone : +33 561557800

TABLE SUMMARIZING THE MODULES THAT MAKE UP THE TRAINING PROGRAM

page	Code	Title of the module	semestre*	ECTS	Mandatory Optional	Cours	e-Cours	TD	TP	Projet
First semester										
8	KGPM7AAU	TRANSPORT PHENOMENA (Transport Phenomena)	I	3	O	15		15		
9	KGPM7ABU	SEPARATION SCIENCE	I	6	O	30		30		
10	KGPM7ACU	COLLOID AND SURFACE ENGINEERING	I	3	O	15		15		
11	KGPM7ADU	LIFE CYCLE ANALYSIS, SECURITY, NORM AND RISK	I	3	O	15		15		
12	KGPM7AEU	BIOSEPARATION SCIENCE	I	3	O	15		15		
13	KGPM7AFU	PROJECT	I	6	O					60
14	KGPM7AGU	PRACTICAL LABS	I	3	O				30	
15	KGPM7AHU	ENTREPRENEURSHIP AND INNOVATION	I	3	O		1			
Second semester										
16	KGPM8AAU	MEMBRANE PROCESSES	II	4	O	28		14		
17	KGPM8ABU	PROCESS DESIGN	II	5	O	42		14		
18	KGPM8ACU	INDIVIDUAL PROJECT 2	II	7	O					150
19	KGPM8ADU	APPLIED REACTION KINETICS	II	5	O	28		28		
20	KGPM8AEU	HUMAN RESOURCES MANAGEMENT SYSTEMS	II	6	O	28		28	28	
21	KGPM8AFU	VALORISATION, COMMERCIALISATION AND ENTREPRENEURSHIP	II	3	O	28		14		

* **AN** :year long teaching, **I** : first semester, **II** : second semester

LIST OF THE MODULES

UE	TRANSPORT PHENOMENA (Transport Phenomena)	3 ECTS	1st semester
KGPM7AAU	Cours : 15h , TD : 15h	Teaching in anglais	Personal work 75 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

HALLEZ Yannick
Email : yannick.hallez@univ-tlse3.fr

SUMMARY OF THE CONTENT

General concepts about transport phenomena and the analogy between momentum, mass and heat transfer,

SPECIFICITIES

Enseignement en anglais.

TARGETED SKILLS

Develop momentum, mass and heat balances to determine velocity, concentration or temperature fields
Use adimensional correlations to estimate friction, mass transfer or heat transfer coefficients at interfaces,
Estimate the consequences of the coupling of transport phenomena in major processes,
Evaluate the limiting transport phenomena in a processes through the calculation of an adimensionnal number.

REFERENCES

- Bird, Stewart and Lightfoot, Transport Phenomena
- Guyon, Hulin and Petit, Physical hydrodynamics

KEYWORDS

heat, mass, momentum, transfer, transport, fluid mechanics

UE	SEPARATION SCIENCE	6 ECTS	1st semester
KGPM7ABU	Cours : 30h , TD : 30h	Teaching in anglais	Personal work 150 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

BACCHIN Patrice
Email : patrice.bacchin@univ-tlse3.fr

UE	COLLOID AND SURFACE ENGINEERING	3 ECTS	1st semester
KGPM7ACU	Cours : 15h , TD : 15h	Teaching in anglais	Personal work 75 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

LAHITTE Jean-François
Email : jean-francois.lahitte@univ-tlse3.fr

UE	LIFE CYCLE ANALYSIS, SECURITY, NORM AND RISK	3 ECTS	1st semester
KGPM7ADU	Cours : 15h , TD : 15h	Teaching in anglais	Personal work 75 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

COETSIER Clémence
Email : clemence.coetsier@univ-tlse3.fr

UE	BIOSEPARATION SCIENCE	3 ECTS	1st semester
KGPM7AEU	Cours : 15h , TD : 15h	Teaching in anglais	Personal work 60 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

COETSIER Clémence
Email : clemence.coetsier@univ-tlse3.fr

UE	PROJECT	6 ECTS	1st semester
KGPM7AFU	Projet : 60h	Teaching in anglais	Personal work 150 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

HALLEZ Yannick
Email : yannick.hallez@univ-tlse3.fr

UE	PRACTICAL LABS	3 ECTS	1st semester
KGPM7AGU	TP : 30h	Teaching in anglais	Personal work 45 h

[Retour liste des UE]

TEACHER IN CHARGE OF THE MODULE

LAHITTE Jean-François
Email : jean-francois.lahitte@univ-tlse3.fr

UE	ENTREPRENEURSHIP AND INNOVATION	3 ECTS	1st semester
KGPM7AHU	e-Cours : 1h	Teaching in anglais	Personal work 75 h

[Retour liste des UE]

UE	MEMBRANE PROCESSES	4 ECTS	2nd semester
KGPM8AAU	Cours : 28h , TD : 14h	Teaching in anglais	Personal work 100 h

[Retour liste des UE]

UE	PROCESS DESIGN	5 ECTS	2nd semester
KGPM8ABU	Cours : 42h , TD : 14h	Teaching in anglais	Personal work 125 h

[Retour liste des UE]

UE	INDIVIDUAL PROJECT 2	7 ECTS	2nd semester
KGPM8ACU	Projet : 150h	Teaching in anglais	Personal work 175 h

[Retour liste des UE]

UE	APPLIED REACTION KINETICS	5 ECTS	2nd semester
KGPM8ADU	Cours : 28h , TD : 28h	Teaching in anglais	Personal work 125 h

[Retour liste des UE]

UE	HUMAN RESOURCES MANAGEMENT SYSTEMS	6 ECTS	2nd semester
KGPM8AEU	Cours : 28h , TD : 28h , TP : 28h	Teaching in anglais	Personal work 150 h

[Retour liste des UE]

UE	VALORISATION, COMMERCIALISATION AND ENTREPRENEURSHIP	3 ECTS	2nd semester
KGPM8AFU	Cours : 28h , TD : 14h	Teaching in anglais	Personal work 75 h

[Retour liste des UE]

GLOSSARY

GENERAL TERMS

DEPARTMENT

The departments are teaching structures within components (or faculties). They group together teachers lecturing in one or more disciplines.

MODULE

A semester is structured into modules that may be mandatory, elective (when there is a choice) or optional (extra). A module corresponds to a coherent teaching unit whose sucessful completion leads to the award of ECTS credits.

ECTS: EUROPEAN CREDITS TRANSFER SYSTEM

The ECTS is a common unit of measure of undergraduate and postgraduate university courses within Europe, created in 1989. Each validated module is thus assigned a certain number of of ECTS (30 per teaching semester). The number of ECTS depends on the total workload (lectures, tutorials, practicals, etc.) including individual work. The ECTS system aims to facilitate student mobility as well as the recognition of degrees throughout Europe.

TERMS ASSOCIATED WITH DEGREES

Degrees have associated domains, disciplines and specialities.

DOMAIN

The domain corresponds to a set of degrees from the same scientific or professional field. Most of our degrees correspond to the domain Science, Technology and Health.

DISCIPLINE

The discipline corresponds to a branch of knowledge. Most of the time a discipline consists of several specialities.

SPECIALITY

The speciality constitutes a particular thematic orientation of a discipline chosen by a student and organised as a specific trajectory with specialised modules.

TERMS ASSOCIATED WITH TEACHING

LECTURES

Lectures given to a large group of students (for instance all students of the same year group) in lecture theatres. Apart from the presence of a large number of students, lectures are characterized by the fact they are given by a teacher who defines the structure and the teaching method. Although its content is the result of a collaboration between the teacher and the rest of the educational team, each lecture reflects the view of the teacher giving it.

TD : TUTORIALS

Tutorials are work sessions in smaller groups (from 25 to 40 students depending on the department) led by a teacher. They illustrate the lectures and allow students to explore the topics deeper.

TP : PRACTICALS

Teaching methods allowing the students to acquire hands-on experience concerning the knowledge learned during lectures and tutorials, achieved through experiments. Practical classes are composed of 16 to 20 students. Some practicals may be partially supervised or unsupervised. On the other hand, certain practicals, for safety reasons, need to be closely supervised (up to one teacher for four students).

PROJECT

A project involves putting into practice in an autonomous or semi-autonomous way knowledge acquired by the student at the university. It allows the verification of the acquisition of competences.

FIELD CLASS

Field classes are a supervised teaching method consisting of putting into practice knowledge acquired outside of the university.

INTERNSHIPS

Internships are opportunities enabling students to enrich their education with hands-on experience and to apply lessons learned in the classroom to professional settings, either in industry or in research laboratories. Internships are strongly regulated and the law requires, in particular, a formal internship convention established between the student, the hosting structure and the university.

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