Livret de formation

Master 2 - MP2

Microbiology and Physicochemistry for Food and Wine Processes

Programme 2024 - 2025

Programme

Semestre 4

Master 2 Microbiology and Physicochemistry for Food and Wine Processes - M2 MP2			
Unité d'enseignement	Module	Heures étudiant	Coefficient
M2MP2-S4-AA-UE06 - STAGE	Stage	80	30
M2MP2-S4-AA-UE07 - OPTIONS FACULTATIVES	LV2 (1)	0	1
	Stage supplémentaire facultatif (2)	-	0
	Total	**80**	

M2MP2-S4-AA-UE06 : STAGE
Module Obligatoire

M2MP2-S4-AA-UE06-M01

Stage

Nb heures / étudiant	80				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	-	-	80	-
Nb groupes	-	-	-	1	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Stephane GUYOT, Elias BOU MAROUN, Camille LOUPIAC, Laurent GAL

Objectifs du module	The aim of the internship is to complement academic training with immersion in the professional world, enabling students to acquire practical skills and prepare effectively for their future careers in the agri-food industry. The internship will allow students to develop their critical analysis skills, identify problems, and propose innovative solutions. Students will be able to experiment and test hypotheses in a real environment, receiving direct feedback on the results obtained. The ultimate aim is to prepare students to pursue a PhD in academic laboratories, research institutes, or R&D departments of international food companies.
Objectifs d'apprentissage	
Pré-requis	
Contenu	The internship duration is at least 5 months and at most 6 months. It takes place mainly in the agri-food, pharmaceutical, or medical industries, in private research laboratories, or in academic reception laboratories. The nature of the internship, its duration, and the subject to be addressed are jointly determined by the internship supervisor and the master’s program manager. The follow-up of these internships is ensured by an academic tutor, who may visit the host company. The internship culminates in a written report of 20 pages and an oral defence of 20 minutes before a jury. The internship is validated through an assessment evaluating both the written report and the oral defence. The evaluation of the student's skills by the internship supervisor is also taken into account in the overall assessment of the internship.

Évaluations	Stage	CT : Soutenance de stage	CT : Rapport de stage
Coefficient	6	12	12

M2MP2-S4-AA-UE07 : OPTIONS FACULTATIVES
Module Facultatif

M2MP2-S4-AA-UE07-M01

LV2 (1)

Nb heures / étudiant	0				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	-	-	-	-
Nb groupes	-	-	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Module ressource, non concerné

Objectifs du module	
Objectifs d'apprentissage	
Pré-requis	
Contenu	

Évaluations	-
Coefficient	-

M2MP2-S4-AA-UE07 : OPTIONS FACULTATIVES
Module Facultatif

M2MP2-S4-AA-UE07-M02

Stage supplémentaire facultatif (2)

Nb heures / étudiant					
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	-	-	-	-
Nb groupes	-	-	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Module ressource, non concerné

Objectifs du module	
Objectifs d'apprentissage	
Pré-requis	
Contenu	

Évaluations	-
Coefficient	-

Semestre 3

Master 2 Microbiology and Physicochemistry for Food and Wine Processes - M2 MP2			
Unité d'enseignement	Module	Heures étudiant	Coefficient
M2MP2-S3-AA-UE01B - TOOLBOX	Toolbox	50	1
	Gestion de projet	48	5
M2MP2-S3-AA-UE01A - TOOLBOX ET GESTION DE PROJET	Toolbox	50	1
	Gestion de projet	48	5
M2MP2-S3-AA-UE02B - ANALYSE DES ALIMENTS ET DES VINS	Analyse des aliments et des vins	50	6
M2MP2-S3-AA-UE02A - MICROBIOLOGIE APPLIQUÉE À LA SÉCURITÉ ALIMENTAIRE : PATHOGÈNES ET ALTÉRATIONS DE LA FLORE	Microbiologie appliquée à la sécurité alimentaire : pathogènes et altérations de la flore	50	6
M2MP2-S3-AA-UE03B - STABILITÉ DE LA NOURRITURE ET DU VIN	Stabilité de la nourriture et du vin	50	6
M2MP2-S3-AA-UE03A - INTERACTIONS ET ADAPTATIONS DES MICRO-ORGANISMES À LEUR ENVIRONNEMENT	Interactions et adaptations des micro-organismes à leur environnement	50	6
M2MP2-S3-AA-UE04B - LA CONCEPTION D'ALIMENTS PAR LE BIAIS DE LA PHYSICOCHIMIE	La conception d'aliments par le biais de la physicochimie	50	6
M2MP2-S3-AA-UE04A - LA CONCEPTION DE LA NOURRITURE ET DU VIN AU MOYEN DE LA MICROBIOLOGIE	La conception de la nourriture et du vin au moyen de la microbiologie	50	6
M2MP2-S3-AA-UE05B - CHIMIE ET TOXICOLOGIE APPLIQUÉES À LA SÉCURITÉ DES ALIMENTS	Chimie et toxicologie appliquées à la sécurité des aliments	50	6
M2MP2-S3-AA-UE05A - LES PROCÉDÉS ALIMENTAIRES ET LES TECHNOLOGIES ÉMERGENTES	Les procédés alimentaires et les technologies émergentes	50	6
M2MP2-S3-AA-UE07B - OPTIONS FACULTATIVES	LV2 (1)	0	1
	Stage supplémentaire facultatif (2)	-	0
M2MP2-S3-AA-UE07A - OPTIONS FACULTATIVES	LV2 (1)	0	1
	Stage supplémentaire facultatif (2)	-	0
	Total	**596**	

M2MP2-S3-AA-UE01B : TOOLBOX
Module Obligatoire

M2MP2-S3-AA-UE01B-M01

Toolbox

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	38	12	-	-	-
Nb groupes	1	1	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Walid HORRIGUE, Laurence DUJOURDY

Objectifs du module	
Objectifs d'apprentissage	
Pré-requis	
Contenu	

Évaluations	CC : mise en situation pratique individuelle
Coefficient	1

M2MP2-S3-AA-UE01B : TOOLBOX
Module Obligatoire

M2MP2-S3-TC-UE01-M02

Gestion de projet

Nb heures / étudiant	48				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	48	-	-	-
Nb groupes	-	1	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Stephane GUYOT, Elias BOU MAROUN

Objectifs du module	The students are required to lead a group or individual project that includes conducting a literature search and an experimental component. This project is sponsored by academic or industrial research partners. The objectives of this supervised project are to apply the knowledge of project management, experimental planning, databases, and data analysis. Group collaboration aims to enhance students' understanding of teamwork dynamics. Projects will predominantly take place in the master's laboratories and utilize their associated platforms, providing students with operational insights into these facilities. For dual engineering/M2 students, this project replaces the project C in their engineering education curriculum. The project culminates in a written report and two presentations (one at the beginning and one at the end), both conducted in English.
Objectifs d'apprentissage	
Pré-requis	
Contenu	This teaching unit involves 9 to 10 weeks of work under a research project supervised by an academic or industrial partner. This unit represents a small research project where students work alone or within a group to conduct: - Bibliographic search - State of the art presentation - Lab experiments - Data treatment - Statistics courses - Report writing - Final oral presentation of their work in the form of a poster

Évaluations	CC : mise en situation pratique individuelle
Coefficient	5

M2MP2-S3-AA-UE01A : TOOLBOX ET GESTION DE PROJET
Module Obligatoire

M2MP2-S3-AA-UE01A-M01

Toolbox

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	16	34	-	-	-
Nb groupes	1	1	-	-	-

Enseignants responsables	Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Laurence DUJOURDY, Walid HORRIGUE

Objectifs du module	
Objectifs d'apprentissage	
Pré-requis	
Contenu	

Évaluations	CC : mise en situation pratique individuelle
Coefficient	1

M2MP2-S3-AA-UE01A : TOOLBOX ET GESTION DE PROJET
Module Obligatoire

M2MP2-S3-TC-UE01-M02

Gestion de projet

Nb heures / étudiant	48				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	48	-	-	-
Nb groupes	-	1	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Stephane GUYOT, Elias BOU MAROUN

Objectifs du module	The students are required to lead a group or individual project that includes conducting a literature search and an experimental component. This project is sponsored by academic or industrial research partners. The objectives of this supervised project are to apply the knowledge of project management, experimental planning, databases, and data analysis. Group collaboration aims to enhance students' understanding of teamwork dynamics. Projects will predominantly take place in the master's laboratories and utilize their associated platforms, providing students with operational insights into these facilities. For dual engineering/M2 students, this project replaces the project C in their engineering education curriculum. The project culminates in a written report and two presentations (one at the beginning and one at the end), both conducted in English.
Objectifs d'apprentissage	
Pré-requis	
Contenu	This teaching unit involves 9 to 10 weeks of work under a research project supervised by an academic or industrial partner. This unit represents a small research project where students work alone or within a group to conduct: - Bibliographic search - State of the art presentation - Lab experiments - Data treatment - Statistics courses - Report writing - Final oral presentation of their work in the form of a poster

Évaluations	CC : mise en situation pratique individuelle
Coefficient	5

M2MP2-S3-AA-UE02B : ANALYSE DES ALIMENTS ET DES VINS
Module Obligatoire

M2MP2-S3-AA-UE02B-M01

Analyse des aliments et des vins

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	8	22	20	-	-
Nb groupes	1	1	0.5	-	-

Enseignants responsables	Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Objectifs du module	The objective of this teaching unit is to provide students with comprehensive knowledge and practical skills in food and wine analysis. Through a combination of lectures, tutorials, and practical sessions, students will learn various analytical techniques used to assess the composition, quality, authenticity, and safety of food and wine. The course covers fundamental principles, sample preparation methods, advanced instrumentation (such as LC-MS, GC-MS, spectroscopy, Dielectric- RPE, and NMR), and the interpretation of analytical data. By the end of the unit, students will be equipped to apply these techniques in real-world scenarios, contributing to the enhancement of food and wine quality control and fraud detection.
Objectifs d'apprentissage	
Pré-requis	
Contenu	Lecture 1. Intro to Food Analysis. Lecture 2. Intro to Wine Analysis. Lecture 3. Examples of food and wine analysis. Lecture 4. Biophysics of proteins. Tutorails 1 & 2. Sample preparation. Tutorial 3. LC- MS: applied to wine metabolimics. Tutorial 4. GC-MS-olfactometry: applied to aroma coumpounds. Tutorial 5. Spectroscopies applied to wine composition and authenticity (AAS, IR, Fluo, ICP). Tutorial 6. (2h) Debriefing Practical, statistics. Tutorials 7 & 8. Dielectric- RPE, DMTA, NMR to study relaxation phenomenon. Tutorial 9. Debriefing Practical. Parctical 1: Fraud detection (application to wine): samples preparations, main compounds or traces. Practical 2: Physical chemical characterizations (physical state, interfacial structure, scattering)

Évaluations	CC : écrit individuel	CT : écrit individuel
Coefficient	2	4

M2MP2-S3-AA-UE02A-M01

Microbiologie appliquée à la sécurité alimentaire : pathogènes et altérations de la flore

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	18	8	24	-	-
Nb groupes	1	1	1	-	-

Enseignants responsables	Helene LICANDRO, Laurent GAL, Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Remy CACHON, Yves WACHE, Helene LICANDRO, Laurent GAL

Objectifs du module	The objective of this unit is to provide knowledge on pathogenic microorganisms and ways of controlling their development. Emphasis is placed on research-based training through article analysis, design and implementation of experimental work to apply the different strategies identified in progress.
Objectifs d'apprentissage	
Pré-requis	Basis knowledge in foodborne pathogens: identificatin, virulence mechanisms and pathogen/food matrix pairing
Contenu	*L. monocytogenes*: virulence, response to environment Prediction of pathogen growth as a function of atmosphere composition Soil microbiology + antibioresistance Analysis of microbial physiology by the mean of the flow cytometry Bacteria-Human Norovirus interaction Predictive microbiology (Sym'Previus, growth and death) spoilage microorganisms in wine Development of a scientific approach to a elucidate a question related to pathogenicity (practicals)

Évaluations	CC : compte-rendu ou rapport écrit en groupe	CT : écrit individuel
Coefficient	2	4

M2MP2-S3-AA-UE03B : STABILITÉ DE LA NOURRITURE ET DU VIN
Module Obligatoire

M2MP2-S3-AA-UE03B-M01

Stabilité de la nourriture et du vin

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	8	24	18	-	-
Nb groupes	1	1	1	-	-

Enseignants responsables	Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Objectifs du module	The objective of this teaching unit is to equip students with advanced knowledge and practical expertise in contemporary challenges and innovations in food packaging, wine stability, and the encapsulation of food components. The unit covers trends in food packaging, techniques for stabilizing and analyzing wine, and methods for encapsulating food components to control their release and improve their stability. Through lectures, tutorials, and practical sessions, students will explore case studies, analyze scientific articles, and engage in hands-on experiments. By the end of the unit, students will be proficient in predicting shelf life, understanding new technologies for preventing food degradation, and evaluating the properties of food packaging and wine fining techniques.
Objectifs d'apprentissage	
Pré-requis	
Contenu	Lecture 1: Trends in food packaging. Lecture 2&3: Wine Stability and analysis. Lecture 4: Encapsulation of food components to stabilize and target- Control release. Tutorial 1: Wine stability -articles study. Tutorial 2: Encapsulation articles study. Tutorial 3: Food packaging and shelf life. Tutorial 4: Shelf life prediction. Tutorial 5: New technologies (ingredients and process) for food degradation prevention or for improving the shelf-life: new ingredients, encapsulation. Tutorial 6: Case studies from praticals (properties of food packaging). Tutorial 7: Final Debriefing of practicals (wine fining and emulsions). Practical 1: Wine fining and emulsions. Practical 2: Properties of food packaging.

Évaluations	CC : écrit individuel	CT : écrit individuel
Coefficient	2	4

M2MP2-S3-AA-UE03A-M01

Interactions et adaptations des micro-organismes à leur environnement

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	28	4	18	-	-
Nb groupes	1	1	1	-	-

Enseignants responsables	Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	A venir pour les formations autres qu'ingénieurs
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Pascale WINCKLER, Helene LICANDRO

Objectifs du module	The skills acquired in this teaching unit concern on the one hand the techniques of large-scale study of different microbial species and on the other hand the knowledge of different microbial species (food, human and environmental) and their functions and evolutions according to environmental conditions.
Objectifs d'apprentissage	Known how bacteria, fungi and virus behavior is impacted by their environments. Environements considered: soil, foods and human gut. Get basis in food virology
Pré-requis	Basis knwoledge in food microbiology
Contenu	Sequencing technologies to study the microbiota The human intestinal microbiota Oral Microbiota Study of microbiota for environmental purposes Pesticide soil ecotoxicology / bioremediation Basics in virology and food virology New technologies in food virology (detection of viruses in foods) Impact of different processes (heat) and cleaning procedures (chemicals) on MS2 phage (PFU vs PCR)

Évaluations	CT : écrit individuel	CC : écrit individuel
Coefficient	4	2

M2MP2-S3-AA-UE04B : LA CONCEPTION D'ALIMENTS PAR LE BIAIS DE LA PHYSICOCHIMIE
Module Obligatoire

M2MP2-S3-AA-UE04B-M01

La conception d'aliments par le biais de la physicochimie

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	22	12	16	-	-
Nb groupes	1	1	0.5	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN, Ali ASSIFAOUI, Camille LOUPIAC
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Camille LOUPIAC

Objectifs du module	In this teaching unit, the chemistry and the physical chemistry of the food will be studied from the diluted (liquid) to the concentrated (solid state). main principles and theoretical aspects of physical chemistry applied to food and wine matrices will be presented: chemical reactions – complexities of matrices - main and minor constituants - chemical and physico-chemical multiscale characterization tools – formulation…The physico-chemical characterization of biopolymers (proteins and polysaccharides) and small molecules (aromas, antioxidants) as well as matrices (emulsion, gel suspension, powders) with the effect of the physico-chemical parameters (temperature, pH, Ionic strength …) on their structure and functionalities will be studied in tutorials and practical class.
Objectifs d'apprentissage	
Pré-requis	
Contenu	Lecture 1: Liquids: Chemistry and Physical Chemistry of macromolecules in solution. Lecture 2: Suspensions & stability (stokes law / particules size/ intrinsic viscosity …). Lecture 3: Introduction to wine physical chemsitry. Lecture 4: Interface: Proteins-polysachharide-fat-mixture-structural Characterization- Thermodynimical imcompatibility. Lecture 5 : Interface: Emulsion-Foams- Proteins Tensioactivity-Characterization. Lecrures 6 & 7: Solids: Amorphous / cristalline. Glass transition. Secondary relaxation. Phase and state diagrams. Tutorial 1: Wine Physicochemistry: compounds and matrices. Tutorial 2: Wine Practical Class project: Wine fining : Model Wine + Bentonite + resveratrol Practical: Wine fining: Bento+BLG+resveratrol. Protein-polysaccahride-fat mixture:BLG+triolein-BLG +pectin.

Évaluations	CT : écrit individuel	CC : écrit individuel	CC : oral en groupe
Coefficient	4	1	1

M2MP2-S3-AA-UE04A-M01

La conception de la nourriture et du vin au moyen de la microbiologie

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	21	29	-	-	-
Nb groupes	1	1	-	-	-

Enseignants responsables	Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Stephane GUYOT, Helene LICANDRO, Yves WACHE, Cosette GRANDVALET

Objectifs du module	During this teaching unit, students acquire skills in the selection, modification and implementation of microorganisms and microbial enzymes (physiological, biochemical and molecular), in the production of food and wine. Their competences also concern the products of interest (enzymes or flavours) of these microorganisms.
Objectifs d'apprentissage	Kowing how to manage microbial populations over one or more than one generations (accelerated laboratory evolution: microbial domestication).
Pré-requis	Basic knowledge in food microbiology and molecular biology.
Contenu	Lactic acid bacteria metabolism Relevance of accelerated evolution approaches to adapt µo of interest Adapation of *O. oeni* to low pH in wine context Biotechnology of microorganisms of interest Sequence alignment/KEGG approach + RTqPCR RNAseq analysis + 3D model of proteins: relevance to study the functionality of an enzyme microbial sensorial impact on food Wine microbiology: processes of winemaking + yeasts and Lactic acid bacteria actors Influence of µo on wine properties (yeast interactions and metabolomic) Laffort: microbial selection in oenology Project (include 2h of oral presentation)

Évaluations	CT : écrit individuel	CC : écrit individuel
Coefficient	4	2

M2MP2-S3-AA-UE05B : CHIMIE ET TOXICOLOGIE APPLIQUÉES À LA SÉCURITÉ DES ALIMENTS
Module Obligatoire

M2MP2-S3-AA-UE05B-M01

Chimie et toxicologie appliquées à la sécurité des aliments

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	14	30	6	-	-
Nb groupes	1	1	1	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN, Marie Christine CHAGNON
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Isabelle SEVERIN, Marie Christine CHAGNON

Objectifs du module	The objective of this teaching unit is to provide students with a thorough understanding of hazard identification, risk assessment, and risk management in food processes. The unit covers chemical risk assessment, food allergen management, and food contact packaging risk assessment through a combination of lectures, tutorials, and practical sessions. Students will learn to identify and evaluate hazards, apply analytical methods, and manage risks associated with food production and packaging. The course includes case studies, practical exercises in chemistry and toxicology analysis, and a visit to palteform facility, ensuring that students gain both theoretical knowledge and hands-on experience in food safety and risk management.
Objectifs d'apprentissage	
Pré-requis	
Contenu	Lectures 1&2: Hazard Identification in Food Processes. Lecture 3: Food Risk assessment and management. Lecture 4: Chemical risk assessment: chemical characterization and analytical methods. Lecture 5: Food Allergen risk assessment and management. Lecture 6: Food contact packaging Risk Assessment. Tutorials 1&2: Chemical risk specification. Tutorilas 3&4: Analytical methods. Tutorial 5: Practical class preparation. Tutorials 6&7 : Cases Studies. Tutorial 8: Visit of Dertech. Tutorial 9: Debriefing Practical. Practical: Chemistry and toxicology analysis.

Évaluations	CC : écrit individuel	CT : écrit individuel
Coefficient	2	4

M2MP2-S3-AA-UE05A : LES PROCÉDÉS ALIMENTAIRES ET LES TECHNOLOGIES ÉMERGENTES
Module Obligatoire

M2MP2-S3-AA-UE05A-M01

Les procédés alimentaires et les technologies émergentes

Nb heures / étudiant	50				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	26	24	-	-	-
Nb groupes	1	1	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN, Sebastien DUPONT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	A venir pour les formations autres qu'ingénieurs
Objectifs Developpement Durable	Consommation et production responsables

Intervenants Internes	Laurent BENEY, Jean Marie PERRIER CORNET, Thibaut THERY, Stephane GUYOT, Sebastien DUPONT, Bonastre OLIETE MAYORGA

Objectifs du module	Deep knowledge in microbiological processes of preservation and decontamination. Understanding of the effect of processes at the cellular level. Identification of key parameters involved in survival or death of microorganisms. Knowledge in current technological locks linked to microbiological processes requiring fundamental and applied research Methodology for research in microbiological processes (microbiological aspect, cellular thermodynamics…)
Objectifs d'apprentissage	To consider the microbial response (when microorganisms have to face a physical or chemical challenge) to develop a new strategy to product/stabilize microorganisms of interest (probiotics and ferments) or to fight against undesired microorganisms (foodborne pathogens or alteration flora): combine cell biology and physics (process). Identify relevant scientific questions in the field of food microbial processes.
Pré-requis	Basic knowledge in food microbiology and food processes
Contenu	Introduction to food microbiological processes Management of microbial risk by processes Spores and HHP / Biopreservation Light processes to fight against undesired microorganisms R&D in Novolyze (development of surrogates to validate some food decontamination processes) Use of processes for beneficial microorganisms Production de µo en Bioreactors Hot-topics and outlook in food processes

Évaluations	CC : écrit individuel	CT : écrit individuel

Coefficient	2	4

M2MP2-S3-AA-UE07A : OPTIONS FACULTATIVES
Module Facultatif

M2MP2-S3-AA-UE07A-M01

LV2 (1)

Nb heures / étudiant	0				
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	-	-	-	-
Nb groupes	-	-	-	-	-

Enseignants responsables	Stephane GUYOT, Elias BOU MAROUN
Département/UPé	
Compétences	
Objectifs Developpement Durable	Module ressource, non concerné

Objectifs du module	
Objectifs d'apprentissage	
Pré-requis	
Contenu	

Évaluations	-
Coefficient	-

M2MP2-S3-AA-UE07A : OPTIONS FACULTATIVES
Module Facultatif

M2MP2-S3-AA-UE07A-M02

Stage supplémentaire facultatif (2)

Nb heures / étudiant					
Formes Pédago.	CM	TD	TP	ST	Vis
Nb heures	-	-	-	-	-
Nb groupes	-	-	-	-	-

Enseignants responsables	Elias BOU MAROUN, Stephane GUYOT
Département/UPé	SCIENCES ALIMENTS-NUTRITION
Compétences	
Objectifs Developpement Durable	Module ressource, non concerné

Objectifs du module	
Objectifs d'apprentissage	
Pré-requis	
Contenu	

Évaluations	-
Coefficient	-