THE MASTER AGROFOOD CHAIN 2-YEAR PROGRAM

SEMESTER	MODULES	Number of ECTS credits
First year M1 Semester 1 (Sept – Dec)	Discovery of food processing: French wine making	2
	Introduction to the analysis of agrofood chains: concepts and methods	4
	System analysis, sustainability and case study of an agrofood chain	5
	Methodology	3
	Fundamentals of agronomy	2
	Fundamentals of ecology	2
	Fundamentals of economics	2
	Fundamentals of molecular biology and food safety	2
	Multidisciplinary problem resolution project	4
	Communication in English (Level I)	2
	Communication in French (Level I)	2
First year M1 Semester 2 (Jan – June)	Organization, governance and performances of agrofood chains	4
	Rural development and local agrofood chains	4
	Agroecology	4
	Value enhancement of plant biotic resources	4
	Methodology (Level II) and global seminar	4
	Communication in English (Level II)	2
	Communication in French (Level II)	2
	2-month internship in enterprise or research lab / OR / Research essay, in May-June Oral defense first week of July	6
Second year M2 Semester 3 (Sept – Jan)	Food safety and the management of risk and uncertainty in agrofood chains	4
	Nutrition and sustainable food systems	4
	Advanced course in microbiology	3
	Advanced course in agroecology	3
	Advanced course in agricultural economics	3
	Methodology (Level III)	2
	Multidisciplinary research project	3
	Project management	2
	Group tutored project	6
Second year M2 Semester 4 (Feb – July)	5-month internship in enterprise or research lab / OR / Research essay, from beginning of January to end of June Oral defense first week of July	30
	TOTAL	120

THE MASTER AGROFOOD CHAIN DETAILED PROGRAM FOR EACH SEMESTER

M1 - SEMESTER 1
From September to December

MODULES	CONTENT
Discovery of food processing: French wine making	Discover wine making process and wine analysis (physical, chemical and organoleptic)
Introduction to the analysis of agrofood chains: concepts and methods	- Agrofood chains: definitions, analysis methods and major issues - Innovation and changes in agrofood chains - Sustainable agrofood chains: definition and multi-criteria analysis - Case studies and conferences
Case study of an agrofood chain: System analysis, sustainability and innovation	- Introduction to the analysis of complex systems - Sustainable development and innovation: from theory to practice - Group case study of an agrofood chain (visits, data collection and analysis, oral presentation)
Methodology (Level I)	- Office tools and communication skills - Bibliographical search and data analysis
Fundamentals of agronomy	- A review of major principles of plant and animal sciences - From the field to the production system: system analysis - Visits of farms
Fundamentals of ecology	- Ecology and agriculture: an impossible marriage? - Darwinian agriculture - Life histories of domesticated organisms - Agriculture and fragmentation of the habitats - Biodiversity and/in agriculture - Successions in agrosystems - Problem based learning approach, case studies
Fundamentals of economics	- A review of major principles of micro and macro economics - Fundamentals of agricultural economics - Case studies of agricultural enterprises and local markets
Fundamentals of molecular biology and food safety	- Gene structure and expression in Prokaryotes and Eukaryotes - Knowledge of foodborne hazards (biological and chemical hazards) - Molecular techniques for the identification of pathogens in food - Production of recombinant proteins for the food industry and insights into risk management and regulatory aspects
Multidisciplinary problem resolution project	- The objective here is to train students to develop a multidisciplinary approach to analyze and solve a real-life complex problem (diffusion of an innovative farming practice, design of a new food production plant, etc.). Students have to address this problem by combining in a consistent manner the different concepts and methods taught in the 4 disciplinary modules "Agronomy / Ecology / Rural Economics / Biotechnology", and by conducting surveys and field studies.
Communication in French (Level I)	- Introduction to French language and culture
Communication in English (Level I	- Academic written and oral communication in English

M1 – SEMESTER 2
From January to July

MODULE	CONTENT
Organization, governance and performances of agrofood chains	- The economics of industrial organization and of innovation - Agroecology and re-conception of agrofood systems - Agro-environmental policies and territorial governance - Spatial organization of agrofood chains - Case studies
Rural development and local agrofood chains	- Rural development: from theory to practice - The role of quality labeling approach and of local food systems in rural development - The European rural development policies - Case studies
Agroecology	- History, definitions and principles of agroecology - Agroecological approaches - Agroecological transition of agrofood chains - Case studies
Value enhancement of plant biotic resources	- Breeding and biotechnology for crop improvement - Green chemistry - Case studies
Methodology (Level II) and global seminar	- Hypotheses testing and data analysis - Office tools - Tools for internship and job search (biodata, job interviews, etc.) - Global seminar: videoconference sessions on different subjects involving groups of students from 4 to 5 European universities
Communication in English (Level II)	- Academic written and oral communication in English
Communication in French (Level II)	- French language and culture
2 month internship in laboratory or enterprise / OR / Research essay	- Two-month internship in May and June. The main objective here is to discover the professional world and to be initiated to a research project in a laboratory or a research/development in an enterprise. The evaluation includes a written report and an oral presentation on the first week of July. - Possibility under conditions to write and defend a research essay under the supervision of a faculty member of ENSFEA or INPT.

M2 - SEMESTER 3
From September to January

MODULE	CONTENT
Food safety, risks and uncertainty in agrofood chains	Control of foodborne hazards, norms and regulation Microbial ecology and influence of food process on foodborne hazards The HACCP method and application exercise Microbial analysis of foods The role of research in food safety improvement (mycotoxins, EHEC)
Nutrition and sustainable food systems	Nutrition and health related problems Urbanization, nutrition transition and their implications for food supply Case studies of sustainable food systems
Advanced course in agroecology	The emergence and evolution of agroecology: a world perspective Case study of agroecological farming projects with field visits Toolbox for the case study: participatory processes, complex system analysis, territorial approaches
Advanced course in agricultural economics	Introduction to the economics of organizations and of institutions Environmental and ecological economics The governance of agricultural/environmental/rural policies Sustainable development and institutional change Case studies
Advanced course in microbiology	Microbiology and "Omics" (metagenomics, proteomincs, microbiome, transcriptomics) Bacterial community analyses (next-generation sequencing techniques, fingerprinting) Food microbiology (suspicious detection of pathogens, AFNOR analysis methods)
Methodology (Level III)	Protocol and experimental design Data analysis Research organization
Multidisciplinary research project	The objective here is to train students to develop a multidisciplinary research approach to analyze diverse research issues (determinants of farmers' adoption of new agroenvironmental practices, water pollution by chemicals, etc.). Students have to address the issue by elaborating a research project (research questions and hypotheses, methodology, research organization, funding sources)
Project management	Integrate project management principles and tools Agile project management Working in a collective and international setting Elaboration of a research proposal
Group tutored project	The objective here is to train students to manage a project from the conception phase to the final evaluation phase. Groups of students have to manage a real-life research or industrial project related to agrofood issues by using project management tools.

M2 - SEMESTER 4
From February to July

MODULE	CONTENT
5-month internship in laboratory or enterprise / OR / Research essay	- Five to six-month internship from beginning of February to end of June. The main objectives here are, first, to run a research project in a laboratory or a research/development project in an enterprise, and second, to get prepared for finding a job or entering into a Ph.D. program. The evaluation includes the writing and the oral defense of a Master thesis on the first week of July. - Possibility under conditions to write and defend a research essay under the supervision of a faculty member of ENSFEA or INPT.