



Syllabus

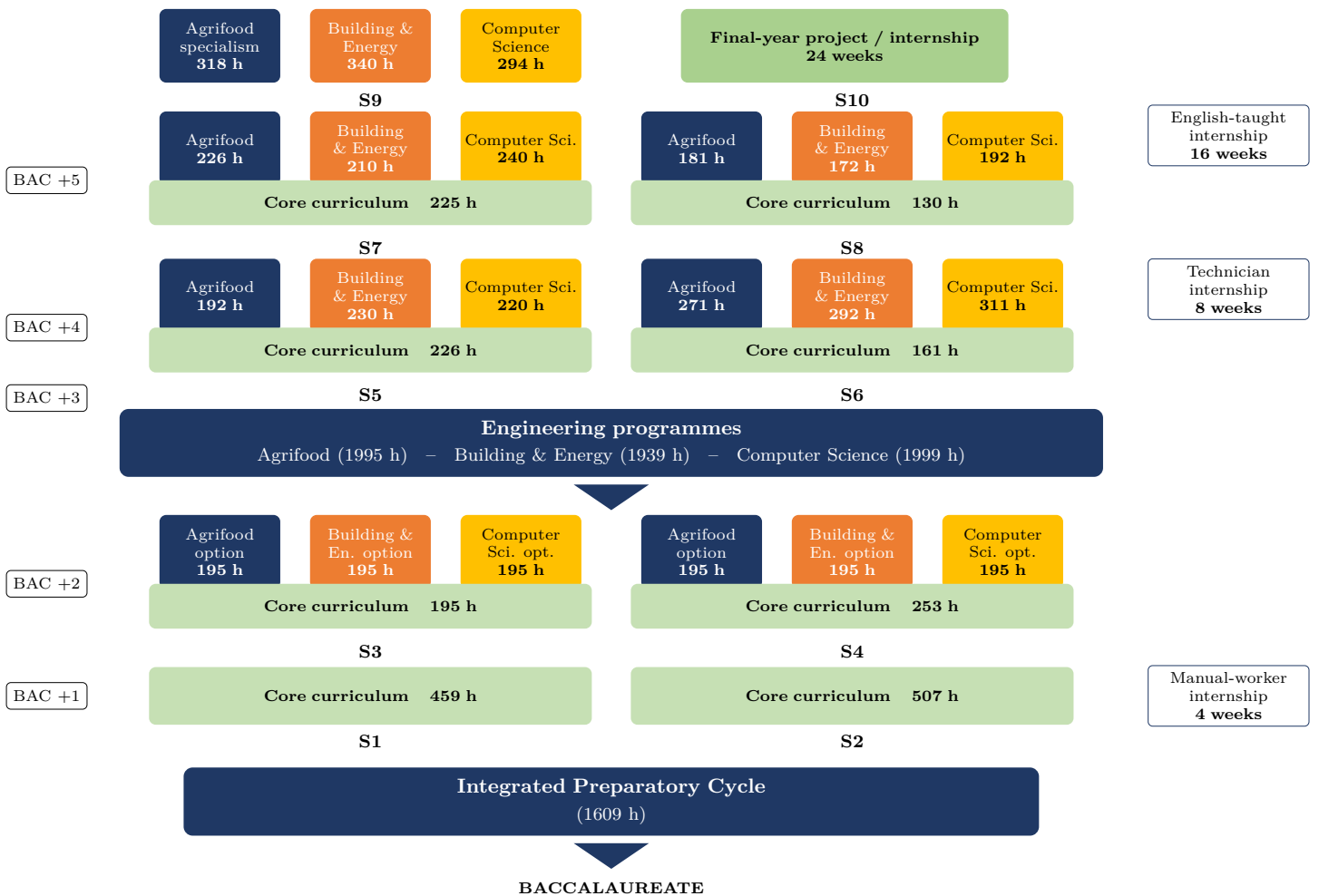
of courses

ESIROI | University of La Réunion

ACADEMIC YEAR 2026 - 2027

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Training programmes



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Curriculum overview

Agroalimentaire — 3A		SEMESTER S5			
Code	Title	CM	TD	TP	ECTS
UE5-PROD: UE5-PROD					
E3AG5PR1	Sport	0	12	0	1
E3AG5PR2	Advanced Mathematics	6	24	0	2
E3AG5PR3	Presentation of tropical sectors	4	4	8	1
E3AG5PR4	Food Process Engineering 1	6	36	8	3
E3AG5PR5	Production Management 1	6	10	0	1
E3AG5PR6	SAÉ Prod	0	4	0	1
UE5-QHSE: UE5-QHSE					
E3AG5QH1	Project Management	6	14	0	1.5
E3AG5QH2	Methodology for Problem Analysis and Resolution	2	10	0	1
E3AG5QH3	SDA: Pathogens and Spoilage	8	28	16	3
E3AG5QH4	TES 1: Anthropocene and Diversity, Equity, Inclusion	12	4	0	1.5
UE5-R: UE5-R et D					
E3AG5RD1	English	0	20	10	2
E3AG5RD2	English or L2	0	10	0	1
E3AG5RD3	Innovation Methodology	8	0	20	2
E3AG5RD4	Research and documentary monitoring	0	14	0	1
E3AG5RD6	Functional properties of food	12	36	8	3
E3AG5RD7	Formulation	4	20	4	2
E3AG5RD8	Nutrition 1 - Nutrient needs and intakes	6	16	0	1.5
UE5-RetD: UE5-RetD					
E3AG5RD5	Applied Marketing in Agri-Food	8	10	0	1.5

Agroalimentaire — 3A		SEMESTER S6			
Code	Title	CM	TD	TP	ECTS
UE6-PROD: UE6-PROD					
E3AG6PR1	sport	0	12	0	1
E3AG6PR2	Knowledge of tropical sectors	4	4	8	1
E3AG6PR3	Control of Systems and Maintenance Management 1	6	14	4	1.5
E3AG6PR4	Complementary Physics	6	18	8	2
UE6-QHSE: UE6-QHSE					
E3AG6QH1	TES 2: Life Cycle Assessment	4	10	0	0.5
E3AG6QH2	TES 2: New Economic and Governance Models	6	0	0	0.5

Agroalimentaire — 3A		SEMESTER S6			
Code	Title	CM	TD	TP	ECTS
E3AG6QH3	Environmental Management in the Food Industry	4	8	0	1
E3AG6QH4	Toxicology	4	4	8	1
E3AG6QH5	Evolution and modification of foods	4	12	6	1.5
E3AG6QH6	Shelf life of food products	2	8	8	1
E3AG6QH7	SDA: HACCP	6	14	0	1.5
E3AG6QH8	QHSE SAE	0	4	0	1
UE6-R: UE6-R et D					
E3AG6RD1	Survey Management	4	14	0	1.5
E3AG6RD10	Supervised Project + Skills Assessment (English/Internship)	0	0	0	3
E3AG6RD11	Individual follow-up / Portfolio	0	0	0	0
E3AG6RD2	English	0	20	10	2
E3AG6RD3	English or L2	0	10	0	1
E3AG6RD4	General Accounting	4	14	0	1.5
E3AG6RD5	Eco-design	2	6	8	1
E3AG6RD6	Sensory evaluation	4	12	8	1.5
E3AG6RD7	Data Analysis 1	2	8	0	1
E3AG6RD8	Analytical tools for the product	6	16	30	3
E3AG6RD9	R&D SAE	0	4	0	1

Agroalimentaire — 4A		SEMESTER S7			
Code	Title	CM	TD	TP	ECTS
UE7-PROD: UE7-PROD : Production					
ESI-SPI-CI-AG4-S7-UE1-EC1	Sports	0	12	0	1
ESI-SPI-CI-AG4-S7-UE1-EC2	Logistics Systems	10	14	0	2
ESI-SPI-CI-AG4-S7-UE1-EC3	Sizing	16	14	8	3
ESI-SPI-CI-AG4-S7-UE1-EC4	Production Management 2	6	8	10	2
ESI-SPI-CI-AG4-S7-UE1-EC5	Control of Systems and Maintenance Management 2	4	14	8	2
ESI-SPI-CI-AG4-S7-UE1-EC6	Food Process Engineering 2	15	45	0	4

Agroalimentaire — 4A		SEMESTER S7			
Code	Title	CM	TD	TP	ECTS
ESI-SPI-CI-AG4-S7-UE1-EC7	Practical work in food process engineering	0	0	24	2
UE7-QHSE: UE7-QHSE : Qualité, Hygiène, Sécurité, Environnement					
ESI-SPI-CI-AG4-S7-UE3-EC1	Strategy	2	8	0	1
ESI-SPI-CI-AG4-S7-UE3-EC2	Labour and Business Law	4	14	0	1.5
ESI-SPI-CI-AG4-S7-UE3-EC3	Quality and Performance Management	4	12	0	1
ESI-SPI-CI-AG4-S7-UE3-EC4	TES 3: OSH, CSR, Engineering Ethics	22	0	0	1.5
ESI-SPI-CI-AG4-S7-UE3-EC5	SAE QHSE	4	0	0	1
UE7-R: UE7-R et D : Recherche et développement					
ESI-SPI-CI-AG4-S7-UE2-EC1	Innovation competition	4	0	16	1.5
ESI-SPI-CI-AG4-S7-UE2-EC2	English	0	20	10	2
ESI-SPI-CI-AG4-S7-UE2-EC3	English or L2	0	10	0	1
ESI-SPI-CI-AG4-S7-UE2-EC4	Data Analysis 2	2	2	6	1
ESI-SPI-CI-AG4-S7-UE2-EC5	Prospective foods and regulations	0	14	0	1
ESI-SPI-CI-AG4-S7-UE2-EC6	General Marketing	4	14	0	1.5

Agroalimentaire — 4A		SEMESTER S8			
Code	Title	CM	TD	TP	ECTS
UE8-PROD: UE8-PROD : Production					

Agroalimentaire — 4A		SEMESTER S8			
Code	Title	CM	TD	TP	ECTS
ESI-SPI-CI-AG4-S8-UE1-EC1	Sports	0	12	0	1
ESI-SPI-CI-AG4-S8-UE1-EC2	HRM	4	14	0	1.5
ESI-SPI-CI-AG4-S8-UE1-EC3	Leadership and Management	4	12	0	1.5
ESI-SPI-CI-AG4-S8-UE1-EC4	Reactors and Bioreactors	4	14	8	2
ESI-SPI-CI-AG4-S8-UE1-EC5	Automation and Maintenance	4	14	8	2
ESI-SPI-CI-AG4-S8-UE1-EC6	Industrial Performance	6	4	0	1
ESI-SPI-CI-AG4-S8-UE1-EC7	SAÉ Prod	4	0	0	1
ESI-SPI-CI-AG4-S8-UE1-EC8	Supervised Project + Skills Assessment (English/Internship)	0	0	0	3
ESI-SPI-CI-AG4-S8-UE1-EC9	Individual follow-up / Portfolio	0	0	0	0
UE8-QHSE: UE8-QHSE : Qualité, Hygiène, Sécurité, Environnement					
ESI-SPI-CI-AG4-S8-UE3-EC1	PRP and HACCP Audit	3	3	12	2
UE8-R: UE8-R et D : Recherche et développement					
ESI-SPI-CI-AG4-S8-UE2-EC1	Innovation competition	0	4	10	1
ESI-SPI-CI-AG4-S8-UE2-EC2	English	0	20	10	2
ESI-SPI-CI-AG4-S8-UE2-EC3	English or second foreign language (LV2)	0	10	0	1
ESI-SPI-CI-AG4-S8-UE2-EC4	Cost Accounting and Financial Diagnosis	7	21	0	2

Agroalimentaire — 4A		SEMESTER S8			
Code	Title	CM	TD	TP	ECTS
ESI-SPI-CI-AG4-S8-UE2-EC5	Food biotechnology	4	14	8	2
ESI-SPI-CI-AG4-S8-UE2-EC6	Applied enzymology	4	15	10	2.5
ESI-SPI-CI-AG4-S8-UE2-EC7	Research seminar	0	8	0	1
ESI-SPI-CI-AG4-S8-UE2-EC8	Nutrition and Health	7	17	8	2.5
ESI-SPI-CI-AG4-S8-UE2-EC9	SAE RD	4	0	0	1

Agroalimentaire — 5A		SEMESTER S9			
Code	Title	CM	TD	TP	ECTS
UE: UE 5 - Projet libre					
E5AG9A11	Juice of the future	14	12	10	3
E5AG9A12	Supply chain management for dairy products	14	12	10	3
E5AG9A21	Innovative products based on local starchy roots	14	12	10	4
E5AG9A22	Underutilized vegetables for nutritional security	20	18	14	4
E5AG9A31	Improving ultra-processed foods	20	18	14	5
E5AG9PI1	Eco-responsible sector development strategy for identity products	8	6	4	1
E5AG9PI2	Food safety in a meat transformation unit	14	12	10	3
E5AG9PL1	Marine resources in an intertropical and insular context	20	18	14	6

Agroalimentaire — 5A		SEMESTER S10			
Code	Title	CM	TD	TP	ECTS
Stages: Stages					
E5E10SAN	English-speaking internship	0	0	0	10
E5E10SFE	Final Year Internship	0	0	0	20

IDENTIFICATION

Course code : E3AG5PR1
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 12
Labs : 0
Total : 12

Project :
Personnal work :

ASSESSMENT

Evaluation at the end of the cycle

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Thomas Barbereau

Modifié le : 14 juillet 2026

UE : UE5-PROD

COURSE : Sport

SCOPE OF THE COURSE

OBJECTIVES

— Develop and improve one's HEALTH. — Commit to sustained effort (intensity/duration). — Analyse and understand the causes and effects of an action. — Gain better self-awareness. — Discover one's physical and mental resources and abilities. — Enhance self-confidence by working on self-esteem.

COMPETENCE AND SKILLS

— Develop and mobilise one's resources (emotional/physical) to enhance motor skills, make them effective, and foster success. — Develop knowledge of organisational methods and risk and safety management related to sporting practices. — Develop leadership skills (managing a group, ability to justify decisions, kindness, fostering a climate of trust and collaboration). — Improve one's HEALTH and understand the key principles to manage one's physical, mental, and social life throughout one's lifetime.

PROGRAM

— Racket sports : learning and improvement in badminton. — Artistic activities : discovery and practical experience in Acrosport. — Team sports : training and coaching in volleyball, beach volleyball, or basketball. — Water sports : initiation and improvement in kayaking. — Physical fitness activities : introduction to general physical preparation and weight training. — Outdoor sports : initiation and improvement in orienteering (CO) or climbing.

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : E3AG5PR2
ECTS : 2

DURATION

Lectures : 6
Tutorial classes : 24
Labs : 0
Total : 30

Project :
Personnal work :

ASSESSMENT

The course is assessed through continuous assessments (CC) including written and oral exams, group evaluations (group work : integrating the APP approach, practical work) and individual evaluations. Group deliverables are required. The final grade combines the grades from each activity with respective coefficients : FG =

TEACHING MATERIALS

The course includes theoretical lectures, tutorials, practical work based on case studies and individual assignments. The course is supported by teaching materials (PPT, handouts, tables, nomograms, etc.) provided by the instructors.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-PROD

COURSE : Advanced Mathematics

SCOPE OF THE COURSE

OBJECTIVES

Review and revision of the mathematical tools necessary for a successful start to the agri-food engineering program

COMPETENCE AND SKILLS

The skills targeted through the learning activities in this module are to : - master the fundamentals of theory and mathematical tools applied to the field of process engineering (agri-food, biological), - introduce modeling and problem-solving for simple and complex scientific problems (to be confirmed or replaced by case studies in Multi-criteria Optimization in processes), - be able to analyze datasets (linear or non-linear modeling methods, model validation, etc.)

PROGRAM

Specialty Agri-Food (to differentiate from other specialties) : Common functions, differentiation and integration. Differential equations (basic review). Linear algebra, matrix algebra.

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : E3AG5PR3
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 4
Labs : 8
Total : 16

Project :
Personnal work :

ASSESSMENT

Continuous assessment, individual knowledge evaluation, oral presentations, report

TEACHING MATERIALS

Course materials provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-PROD

COURSE : Presentation of tropical sectors

SCOPE OF THE COURSE

OBJECTIVES

Course objectives To understand current and emerging tropical agri-food sectors and the tools for valorizing these sectors.

Targeted learning outcomes To know the main production and processing sectors for foods, both traditional and emerging, in tropical regions

To identify technological and biotechnological tools for valorizing tropical agro-resources, in line with agro-ecology and industrial performance objectives to support the competitiveness of agri-food companies.

COMPETENCE AND SKILLS

Select and size equipment based on the target finished product

PROGRAM

- Positioning of food production within sectors.
- Traditional and industrial processing in tropical environments.
- Current technological developments, including the valorization of co-products.
- Sectors, markets, valorization, stabilization, and control of variability in bio-molecules from fresh and processed tropical agroresources.
- Development potential of these resources with an impact on the local economy.

The sectors studied will relate to the development of high-value-added products (coffee, vanilla, cocoa, aromatic plants); the sugar industry; cereals, roots, tubers, and starchy fruits; meats; ranges of fruits and vegetables. Teaching and seminars are provided by professionals from the local agri-food sector, academic researchers, and researchers from CIRAD...

BIBLIOGRAPHY

REQUIREMENTS

Functional properties of foods; food safety; food engineering (unit operations, processes, and food preservation)

IDENTIFICATION

Course code : E3AG5PR4
ECTS : 3

DURATION

Lectures : 6
Tutorial classes : 36
Labs : 8
Total : 50

Project :
Personnal work :

ASSESSMENT

The UE is assessed through continuous assessments (CC) including written and oral exams, group evaluations (group work : integrating the APP approach, practical work) and individual evaluations. Group written deliverables. The final grade combines the grades from each activity with respective coefficients : $NF = 2/6 \text{ CC1} + 2/6 \text{ CC2} + 1/6 \text{ CC3 (home-work)} + 1/6 \text{ (Practical Work 1 + Practical Work 2)}$

TEACHING MATERIALS

The UE includes theoretical courses, tutorials, practical work based on case studies and individual assignments. The UE provides teaching materials (PPT, handouts, tables, abacuses, ...) distributed by instructors.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-PROD

COURSE : Food Process Engineering 1

SCOPE OF THE COURSE

OBJECTIVES

The topics covered in this teaching unit (Food Process Engineering 1) not only concern a review of some important basic concepts in agri-food processes but also present and describe the unit operations grouped according to the nature of the heat and mass transfer that occur, with the aim of treating and/or preserving the quality of the raw material and the finished product.

COMPETENCE AND SKILLS

- These topics are presented and discussed with engineering students to understand, grasp, and better reflect on the choice of unit operations/processes and to select the associated equipment.
- Enable a better understanding of the process to establish the appropriate manufacturing diagram.
- Be able to select the parameters of unit operations for treatment to maximize product quality and safety.

Targeted skills at this level :

- Establish a manufacturing diagram;
- Select and size equipment based on the target finished product
- Conduct a test and control the proper functioning of the production line

PROGRAM

1. Properties of foods : physicochemical properties (density, viscosity, porosity, moisture, aw and pH); biophysical and rheological properties (viscosity, texture, rheological tests or behaviors in flow mode and in oscillatory mode (G' , G'' , ...)); thermal properties (thermal conductivity, specific heat, enthalpy, latent heat); electrical properties (electrical conductivity and dielectric properties); optical properties (refraction, reflection, absorption, ...),
2. Impact of processes on reaction kinetics in foods (kinetics of vitamin degradation);
3. Mass and energy balances in continuous regimes;
4. Thermal conduction (steady state, heat exchanger concept, thermal resistance, critical radius of insulation), conduction in transient regime (initial conditions and boundary conditions in heat transfer problems, lumped systems, infinite, semi-infinite and finite solids, error function), heating and cooling in industrial systems; thermal equipment used in the food industry
5. Thermal convection (introduction to Newton's law, free and forced convection, dimensionless numbers (Reynolds, Prandtl, Nusselt, Grashof), determination of transfer coefficients, phase changes)
6. Knowledge and application of heat treatment and preservation processes (appertization, pasteurization, dehydration, evaporation and concentration, and cooking)
7. Practical work (pasteurization, monitoring reaction kinetics under thermal treatment, appertization, dehydration, cooking).

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- Bimbenet, J.-J., Loncin, M. (1995). *Bases du génie des procédés alimentaires*. Lavoisier.
- *Techniques de l'ingénieur* collection.
- Journals and other works (English-language, ...).

REQUIREMENTS

- Basic knowledge in applied mathematics, physics, chemistry, rheology/fluid mechanics, heat/mass transfer, biochemistry, microbiology, food constituents.
- Knowledge of major foodborne pathogens and spoilage flora.

IDENTIFICATION

Course code : E3AG5PR5
ECTS : 1

DURATION

Lectures : 6
Tutorial classes : 10
Labs : 0
Total : 16

Project :
Personnal work :

ASSESSMENT

"The UE is assessed through continuous assessments (CC) including written and oral exams, group evaluations (group work) and individual evaluations. Group deliverables. The final grade combines the grades from each activity with respective coefficients : $FG = 1/3 CA1 + 1/3 CA2 + 1/3 CA3 (HW)$ "

TEACHING MATERIALS

"The UE includes theoretical courses, tutorials, practical work based on case studies and individual assignments. The UE provides teaching materials (PPT, handouts, tables, charts, etc.) shared by the instructors."

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-PROD

COURSE : Production Management 1

SCOPE OF THE COURSE

OBJECTIVES

- Discover the basics of production management
- Understand planning, inventory management and quality control concepts
- Grasp the challenges of production management (constraints, specificities, waste, cost, lead time...)
- Discover the principles of Lean management

COMPETENCE AND SKILLS

- Establish a manufacturing flowchart;
- Select and size equipment based on the target finished product;
- Conduct a test and verify the proper functioning of the production line.

PROGRAM

1. Production management
2. Production processes
3. Basics of planning
4. Inventory management
5. Introduction to quality control (SPC) and standards
6. Challenges and specificities of production in the agri-food sector
7. Global approach to Lean Management

BIBLIOGRAPHY

- *Production Management*, A. Courtois, M. Pillet, Ed. d'Organisation, 2003
- E.M. Goldratt and J. Cox, *The Goal : A Process of Ongoing Improvement*, AFNOR, 1993
- D. Hutchins, *Just-in-Time*, AFNOR, 1989
- S. Shingo, *A Study of the Toyota Production System from an Industrial Engineering Viewpoint*, Productivity Press, 1989
- G. Baglin, O. Bruel, A. Garreau, M. Greif and C. Delft, *Management industriel et logistique*, Economica, 2001
- J. P. Womack and D. T. Jones, *Lean Thinking*, 1996 Techniques de l'ingénieur

REQUIREMENTS

Knowledge of accounting / business management Basic mathematics / statistics

IDENTIFICATION

Course code : E3AG5PR6
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 4
Labs : 0
Total : 4

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE5-PROD

SAÉ Prod

SCOPE OF THE CHALLENGE

WORKING SITUATION

COMPETENCES AND LEVEL ASSESSED

EXPECTED OUTPUTS

RESOURCES

IDENTIFICATION

Course code : E3AG5QH1
ECTS : 1.5

DURATION

Lectures : 6
Tutorial classes : 14
Labs : 0
Total : 20

Project :
Personnal work :

ASSESSMENT

2 continuous assessment (CA) grades

TEACHING MATERIALS

Course and TD materials provided

LANGUAGE

English

CONTACT

Julien LEONARD

Modifié le : 14 juillet 2026

UE : UE5-QHSE

COURSE : Project Management

SCOPE OF THE COURSE

OBJECTIVES

Be able to successfully lead a project as a project manager

COMPETENCE AND SKILLS

— Apply methodologies suited to project management and problem-solving

PROGRAM

— Definitions (Project management, What is a project, From idea to project, Characteristics of a project, Some remarks). — Project management environment (Management, Steering, Planning, Conduct, Project management objectives, Difficulties, Most frequent causes of failure). — Project preparation I. Defining the project in broad terms – The framing note — The project (Brief definition, Essential characteristics, Motives). — Objectives (Technical objectives, deadlines, cost, objective hierarchy). — The technique (Main difficulties, Contingency plan). — The schedule (Brief) Key dates — Resources (Human, Material). — Project management (Project manager, Project team). — Communication (Internal, External with suppliers) II. Setting up the project team; III. Breaking down tasks; IV. Identifying constraints and risks; V. Performing planning; VI. Estimating costs. — Project execution (Execution and monitoring) I. Launching actions to start the project; II. Periodically analyzing progress; III. Making necessary syntheses; IV. Applying corrective actions if necessary.

BIBLIOGRAPHY

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG5QH2
ECTS : 1

DURATION

Lectures : 2
Tutorial classes : 10
Labs : 0
Total : 12

Project :
Personnal work :

ASSESSMENT

Project-based learning (solving a problem)
Oral presentation Submission of a report

TEACHING MATERIALS

Course materials Case studies

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-QHSE

COURSE : Methodology for Problem Analysis and Resolution

SCOPE OF THE COURSE

OBJECTIVES

Master a set of methods and tools for analyzing a situation to be improved and formalizing an appropriate action plan.

COMPETENCE AND SKILLS

— Apply methodologies suited to project management and problem-solving

PROGRAM

— Problem-solving methods : DMAIC, A3, 8D — Associated methods and tools : Brainstorming, QQQCCP, Pareto, Cause-and-effect diagram, 5 Whys, fault tree, solution tree, decision matrix, weighted voting, Gantt chart, SMART objectives/indicators
Case study : in groups of 4/5 students

BIBLIOGRAPHY

Rémi Bachelet - MOOC MARP <https://gestiondeprojet.pm/>

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG5QH3
ECTS : 3

DURATION

Lectures : 8
Tutorial classes : 28
Labs : 16
Total : 52

Project :
Personnal work :

ASSESSMENT

Individual knowledge assessment, group oral presentation, group lab report

TEACHING MATERIALS

Course materials, standards and regulatory texts

LANGUAGE

English

CONTACT

Joël GRILLASCA

Modifié le : 14 juillet 2026

UE : UE5-QHSE

COURSE : SDA : Pathogens and Spoilage

SCOPE OF THE COURSE

OBJECTIVES

Understand the main hazards related to the sanitary safety of a product

COMPETENCE AND SKILLS

Acquire scientific and technical knowledge related to food safety and spoilage — Understand hazards and the assessment of microbiological risks linked to food preservation — Learn hazard analysis methods and propose microbiological criteria — Understand microbiological spoilage and the microorganisms responsible for it

PROGRAM

Main parameters influencing microbial growth both qualitatively and quantitatively (redox potential, pH, water activity, temperature, medium composition, interactions between microbial flora) — National surveillance of infectious diseases, major pathogenic bacteria responsible for foodborne infections (*Salmonella* spp., *Listeria monocytogenes*, *Campylobacter* spp., *Escherichia coli*, *Staphylococcus aureus*, *Bacillus cereus*, *Clostridium perfringens*, *Clostridium botulinum*), other agents potentially involved in foodborne outbreaks (*Trichinella* spp., Norovirus), spoilage flora (lactic acid bacteria, yeasts and moulds) — Food spoilage : microbial development based on matrices and preservation conditions, microbiological, chemical and biochemical spoilage — Analysis methods : detection, enumeration, identification using classical microbiology

BIBLIOGRAPHY

ANSES fact sheets (fact sheets describing biological hazards transmitted by food) — Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs — Santé Publique France (list of notifiable diseases)

REQUIREMENTS

Basic knowledge of cells and microorganisms : microbial growth and trophic types — Food constituents

IDENTIFICATION

Course code : E3AG5QH4
ECTS : 1.5

DURATION

Lectures : 12
Tutorial classes : 4
Labs : 0
Total : 16

Project :
Personnal work :

ASSESSMENT

Individual assessment Oral presentation
Submission of a report

TEACHING MATERIALS

Course materials

LANGUAGE

English

CONTACT

François GARDE

Modifié le : 14 juillet 2026

UE : UE5-QHSE

COURSE : TES 1 : Anthropocene and Diversity,
Equity, Inclusion

SCOPE OF THE COURSE

OBJECTIVES

Understand the functioning of the Earth system and its evolution (past, present, future) by highlighting the unprecedented nature of current changes (pace, great acceleration) and tipping points, demonstrating the anthropogenic origin of these disturbances, and considering all time scales

Gain an overview of forms of inequalities and discrimination in professional settings

COMPETENCE AND SKILLS

— Reduce the environmental impact of a product and integrate the challenges of a just, equitable, and inclusive ecological transition

— Integrate the challenges of a just, equitable, and inclusive ecological transition

PROGRAM

12h (10h lectures / 2h tutorials) - The Anthropocene : origins and global challenges — Climate and energy transitions — Biodiversity and living systems challenges — Natural resource management — Solutions and perspectives : towards a sustainable future

4h (2h lectures / 2h tutorials) - Collective workshop during integration week :
— Preventing inequalities and discrimination in human resources management

BIBLIOGRAPHY

UVED portal - MOOC

NF ISO 30415 : Human resources management - Diversity and inclusion, September 2021. NF ISO 53800 : Guidelines for promoting and implementing gender equality and women's empowerment, May 2024. AFNOR SPEC Z77-103-0 : Digital inclusion : Best practices guide for tailored adaptation, February 2022. Guide for non-discriminatory recruitment, French Ombudsman, June 2019. Discrimination based on sexual orientation and gender identity, French Ombudsman, March 2020.

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG5RD1
ECTS : 2

DURATION

Lectures : 0
Tutorial classes : 20
Labs : 10
Total : 30

Project :
Personnal work :

ASSESSMENT

Internal assessment Situational assessments of professional skills At least 2 assessments per semester External assessment : TOEIC (S8/S9)

TEACHING MATERIALS

General English : Current affairs topics, press, internet Specialized English : Technical and scientific resources Professional English : CV, cover letter, email TOEIC past papers

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : English

SCOPE OF THE COURSE

OBJECTIVES

This English course, taught in English, aims to develop pragmatic, sociocultural and linguistic skills according to the CEFR in the four language activities, through varied teaching methods in interactive lectures, tutorials and practical sessions. Activities include listening and reading comprehension, written production (essays, summaries, memos, internship reports) and oral production (presentations, group projects, improvisations, discussions and debates), preparing students for professional use of English while fostering critical thinking.

COMPETENCE AND SKILLS

- Understand spoken and written English
- Express oneself in writing and speaking (continuous and interactive production)
- Use general and technical documents
- Prepare for the TOEIC : Level 1 (B1.1)

PROGRAM

- Understand spoken and written English
- Express oneself in writing and speaking (continuous and interactive production)
- Use general and technical documents
- Prepare for the TOEIC : Level 1 (B1.1)

BIBLIOGRAPHY

Authentic written and oral documents, Internet, television resources, foreign press, digital tools, linguistic tools – Global Exam, British Council, BBC Learning English, VoA, monolingual dictionaries. TOEIC past papers. Websites of international and European organizations, both general and specific. General : UN, WHO, WEF, IMF, WTO, World Bank... Specific to the agri-food sector : FAO / FSA / IFST / HACCP / EFFoST

REQUIREMENTS

CEFR B1 Can understand the main points when clear, standard language is used and the subject matter is familiar (work, school, leisure, etc.). Can deal with most situations likely to arise while travelling in an area where the target language is spoken. Can produce a simple connected text on topics that are familiar or of personal interest. Can describe experiences and events, dreams, hopes and ambitions, and briefly give reasons and explanations for opinions and plans.

IDENTIFICATION

Course code : E3AG5RD2
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 10
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

At least two continuous assessments.

TEACHING MATERIALS

Slides and guided work sheets.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : English or L2

SCOPE OF THE COURSE

OBJECTIVES

This course aims to develop students' linguistic, cultural, and communicative skills in a second modern language (Chinese or Spanish). It focuses on acquiring language basics, oral and written fluency, as well as discovering associated cultures, to prepare students for interactions in personal, professional, or academic contexts.

COMPETENCE AND SKILLS

- Communicate with different stakeholders (clients, management, users, IT managers, organizations such as CNIL, ANSSI) in writing and orally
- Ensure appropriate communication with stakeholders, including clients, administrations, citizens, and civil society.

PROGRAM

1. Linguistic initiation

- Basic grammatical structures : present indicative, adjectives, pronouns.

2. Oral communication

- Techniques to improve pronunciation and oral fluency.

3. Written comprehension and expression

- Writing simple letters or emails (personal introduction, request for information).

4. Linguistic and intercultural deepening

- Study of songs, poems, or literary excerpts adapted to the level.

5. Practical project and continuous assessment

- Regular oral and written evaluations to monitor progress.

BIBLIOGRAPHY

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REQUIREMENTS

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IDENTIFICATION

Course code : E3AG5RD3
ECTS : 2

DURATION

Lectures : 8
Tutorial classes : 0
Labs : 20
Total : 28

Project :
Personnal work :

ASSESSMENT

Individual assessment Oral presentation
Report submission

TEACHING MATERIALS

Course materials Lab guide

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : Innovation Methodology

SCOPE OF THE COURSE

OBJECTIVES

Students are able to develop a prototype and gather user feedback by combining ideation, business strategy, and user-centered design.

COMPETENCE AND SKILLS

Generate a product/service idea based on an analysis of the environment and market Develop a functional specification and a simplified technical and financial feasibility analysis

PROGRAM

Research : inspiration and analysis Design Thinking : Understanding user needs, ideation, prototyping, and testing. Teamwork : Effective collaboration, task distribution, and communication. Rapid prototyping : Creating mockups and functional prototypes. Problem solving : Identifying and analyzing complex problems, mastering problem-solving tools, generating and selecting innovative solutions, developing an action plan Communication : Clear and persuasive presentation of ideas and solutions, responding to jury questions

BIBLIOGRAPHY

Design Sprint : A Practical Guidebook for Building Great Digital Products, Richard Banfield, Todd Lombardo, Trace Wax, 2015 Sprint, Jake Knapp, John Zeratsky, Braden Kowitz, 2016 Le Design Sprint en pratique, Pauline Thomas, 2020

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG5RD4
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 14
Labs : 0
Total : 14

Project :
Personnal work :

ASSESSMENT

Project-based learning Submission of a group report.

TEACHING MATERIALS

Course materials provided (PPT).

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : Research and documentary monitoring

SCOPE OF THE COURSE

OBJECTIVES

Ability to find suitable bibliographic resources.

COMPETENCE AND SKILLS

Understanding scientific and technical resources in English; knowing how to generate a database; knowing how to conduct a literature search; knowing how to integrate bibliography into a report; being able to carry out regulatory and normative monitoring

PROGRAM

Documentary research : university libraries, classification systems and types, databases, search equations, verifying internet resources, formatting and referencing tools.

Scientific writing : scientific writing standards, professional French, functional writing. Written communication and professional life : minutes, reports, technical reports, approaches to business communication through writing.

Learning outcomes : Ability to write minutes; ability to write a bibliographic reference within a report; Ability to conduct regulatory and normative monitoring

BIBLIOGRAPHY

ScienceDirect, PubMed.

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG5RD6
ECTS : 3

DURATION

Lectures : 12
Tutorial classes : 36
Labs : 8
Total : 56

Project :
Personnal work :

ASSESSMENT

Continuous assessments, oral presentations, project report, 1 lab report

TEACHING MATERIALS

Course materials, tutorials, and lab work documents provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : Functional properties of food

SCOPE OF THE COURSE

OBJECTIVES

Course objectives Master the functional properties of the 3 major classes of food constituents (proteins, carbohydrates, lipids) as well as food additives. Understand the determinants of the water component in foods.

Intended learning outcomes Understand the 'how' of constituent structure and environment that affect physicochemical properties such as solubility, density, optical rotation, melting point and range, crystalline form, oxidative stability, chemical/biochemical reactivity of carbohydrates, lipids, and proteins. Master knowledge of physicochemical properties for developing techno-functional applications of the main constituents of foods. Know how to extrapolate on formulation, transformation, and preservation strategies.

COMPETENCE AND SKILLS

Formulate and transform a product Understand scientific and technical resources in English

PROGRAM

I Properties of classes of food constituents and functional properties
1) Relationship between carbohydrate structures in foods and physicochemical/techno-functional properties
a- Functions of mono- and oligosaccharides in foods. b- Functions of polysaccharides and interactions in food matrices. c- Role of food carbohydrates in food aids or PAI. Hydrocolloids : starches, cellulose, hemicelluloses, xanthan, carrageenans, pectic compounds, alginates. i) Production, structure, properties. ii) Physical and chemical transformation reactions. iii) Enzymatic transformation reactions.
2) Food proteins Recall of protein structures and functions. a- Physicochemical and functional properties of proteins. b- Main sources of proteins and applications in AA. c- Nutritional aspects : essential AAs, protein value, digestibility of food proteins, allergies. d- Modification of food proteins and technological treatments.
3) Food lipids Recall of lipid structures a- Edible fats and oils b- Physicochemical and functional properties c- Role in food technology

II Importance of water in foods
a - Physicochemical properties and structure of water. Interactions water/polar/apolar constituents – hydration properties
b - Water thermodynamics, Aw, vapor pressure – sorption isotherms. Molecular mobility of water and food stability. Water migration in heterogeneous food matrices

III Food additives Classification and regulatory framework
a - Preservatives b – Sensory agents c – Texture agents d – Conditions of use

Lab work : Effect of the composition in macronutrients and additives on the functional properties of finished products. Models of creams/foams or intermediate bakery/viennoiserie/pastry products (e.g., doughs) will be studied.

BIBLIOGRAPHY

REQUIREMENTS

Organic chemistry (main functional groups and reactivity), structure of biomolecules, microbiology, general enzymology

IDENTIFICATION

Course code : E3AG5RD7
ECTS : 2

DURATION

Lectures : 4
Tutorial classes : 20
Labs : 4
Total : 28

Project :
Personnal work :

ASSESSMENT

Individual knowledge assessment
Project-based learning
Group oral presentation
Submission of a group report for the lab work.

TEACHING MATERIALS

Course materials (PPT) provided.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : Formulation

SCOPE OF THE COURSE

OBJECTIVES

Master the justification for selecting constituents leading to formulation in RD ; Master the process of creating a food product from idea to finished product "from farm to fork" with economic performance requirements ; Apply acquired skills through a practical situation involving the development of a new product based on agro-resources, particularly tropical ones. 4-How to choose while anticipating the technological properties of ingredients (Starches and hydrocolloids : their behavior during cooking and processing, effects of product and manufacturing process parameters, role of pH, role of acidifiers, role of temperature, role of agitation, interactions with other ingredients, importance of their implementation. 5-Addressing the aroma component : legislation, extraction methods, their use, their technology, absorption on carriers (dry mixing, matrix encapsulation, membrane encapsulation, molecular encapsulation, atomization, granulation). Spices and aromatic plants : their technology, roles and usage constraints. 6-Incorporation of other additives and/or ingredients : acidifiers, emulsifiers, vegetable and animal proteins. Study of preparation and assembly of constituents : preparation methods, technologies implemented. 7-Evaluation of container suitability and different types of packaging : cans, jars, plastic trays and lids, flexible packaging. Preservation methods : Appertization, Pasteurization, Freezing, Fresh. Legislative and economic constraints. Techniques for preparing products from fats. 8-Laboratory work.

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints (Nutri-Score, anti-food waste law, etc.) ; Design and implement a simple experimental plan ; Formulate and transform a product.

PROGRAM

1-Context and challenges of formulation in AA. 2-Methodology for product development : Defining the demand, developing a specification sheet, project planning and dashboard, identifying factors influencing formulation. 3-Determining formulation phases : ingredient research, implementation of a test protocol, evaluation parameters, validation on mock-ups, industrial testing, hedonic testing. Functional properties of ingredients, the transformation steps and their uses.

BIBLIOGRAPHY

Conception raisonnée des aliments, Cahiers de formulation, - EDP sciences. AU-BRY (J.-M.) and SCHORSCH (G). – Formulation. General presentation. [J 2 110] Formulation (1999). Pense-Lheritier, A.-M. Chapter 12. Formulation of a food supplement in liquid form and in chewable gum form. In Conception des compléments alimentaires ; Lavoisier, 2016 ; pp. 367–386 ISBN 978-2-7430-2221-1. J. ADRIAN, J. POTUS, R. FRANGNE : Food science from A to Z (3rd Edition, 2003), Lavoisier. G. LINDEN, D. LORIENT : Agro-industrial biochemistry, Masson.

REQUIREMENTS

Knowledge of tropical sectors, Life Cycle Assessment, Eco-design, functional properties and molecular interactions in foods, Nutrition : needs and nutritional

intakes, Marketing applied to AA.

IDENTIFICATION

Course code : E3AG5RD8
ECTS : 1.5

DURATION

Lectures : 6
Tutorial classes : 16
Labs : 0
Total : 22

Project :
Personnal work :

ASSESSMENT

Continuous assessment Individual know-
ledge evaluation Project-based learning
with submission of a group report

TEACHING MATERIALS

Course and tutorial materials made avail-
able

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-R

COURSE : Nutrition 1 - Nutrient needs and intakes

SCOPE OF THE COURSE

OBJECTIVES

Be able to identify the nutritional needs of a population. Be able to determine the nutritional value and quality of a food in relation to scientific context and public health issues. Know the regulatory context and be able to create nutritional labeling for foods.

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints. Formulate and transform a product. Adapt and select product characterization methods (physicochemical, rheological, sensory, nutritional, shelf life) according to objectives.

PROGRAM

- Concept of energy balance, methodology for exploring nutritional status and identifying needs.
- Role of nutrients, identification of food sources.
- Public health context and nutritional prevention policy, recommendations and reference intervals for the general population and specific populations.
- Determining nutritional quality factors
- Regulations regarding labeling

BIBLIOGRAPHY

Apports nutritionnels conseillés pour la population française, 3rd edition - Afssa 2001 Update of PNNS benchmarks : Development of nutritional references – Anses, Dec. 2016

REQUIREMENTS

Structure of biomolecules

IDENTIFICATION

Course code : E3AG5RD5
ECTS : 1.5

DURATION

Lectures : 8
Tutorial classes : 10
Labs : 0
Total : 18

Project :
Personnal work :

ASSESSMENT

Project focusing on the analysis of an agri-food brand across its four dimensions.

TEACHING MATERIALS

Course and TD materials provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE5-RetD

COURSE : Applied Marketing in Agri-Food

SCOPE OF THE COURSE

OBJECTIVES

Course Objectives :

Identify, select, and critically analyze various resources to document a topic and synthesize data for practical use. Analyze data and markets, synthesize data for practical use. Conduct market research and consumer behavior studies. Formulate relevant recommendations based on research findings while minimizing financial risks. Understand budgeting and profitability in a marketing plan. Write a marketing action plan. Develop a critical argumentation. Sell a marketing project.

Targeted Objectives : Leverage data for market analysis, synthesize findings, and propose coherent recommendations. Position, develop, and formalize a coherent and profitable marketing strategy in project management, meeting consumer needs and market trends. Master operational marketing dimensions and customer relationship management.

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints (Nutri-Score, anti-waste law, etc.);

PROGRAM

- 1- Marketing Research : Understanding A. External and Internal Diagnosis B. Innovation C. Market Research
- 2- Strategic Marketing : Choosing A. Segmentation B. Targeting C. Positioning
- 3- Operational Marketing : Acting A. Product B. Price C. Distribution D. Communication
- 4- Customer Relationship Management A. Customer Journey Process B. Customer Satisfaction C. Loyalty D. Customer Relationship Management

BIBLIOGRAPHY

Reading specialized press : LSA, Points de vente, Linéaires, etc. G. Bonnafoux and C. Billon, (2013), *L'essentiel du plan marketing opérationnel*, Eyrolles. J-J Lambin and C. de Moerloose, (2016), *Strategic and Operational Marketing : From Marketing to Market Orientation*, Dunod. Y. Pariot, (2010), *Les outils du marketing stratégique et opérationnel*, Eyrolles. J. Clair and S. Pihier, (2011), *Le marketing*, Nathan. S. Soulez, (2017), *L'essentiel du Marketing*, Gualino. J. Lendrevie, J. Lévy, (2013), *Mercator 2013 – Theories and New Marketing Practices*, Dunod. P. Kotler, G. Armstrong, E. Le Nagard-Assayag and T. Lardinois, (2010), *Principles of Marketing*, Pearson. J-P Helfer, J. Orsoni and J-L Nicolas, (2009), *Marketing*, Vuibert.

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG6PR1
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 12
Labs : 0
Total : 12

Project :
Personnal work :

ASSESSMENT

Assessment at the end of the cycle

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Thomas Barbereau

Modifié le : 14 juillet 2026

UE : UE6-PROD

COURSE : sport

SCOPE OF THE COURSE

OBJECTIVES

— Develop and improve one's HEALTH. — Engage in effort (intensity/duration). — Analyze and understand the causes and effects of an action. — Gain better self-awareness. — Discover one's physical and moral resources and abilities. — Boost self-confidence by working on self-esteem.

COMPETENCE AND SKILLS

— Develop and mobilize one's resources (emotional/physical) to enhance motor skills, make them effective, and promote success. — Develop knowledge of organizational methods and risk/safety management related to practices. — Develop leadership skills (managing a group, justifying decisions, kindness, fostering a climate of trust and collaboration). — Improve HEALTH and understand key principles to manage one's physical, mental, and social life throughout life.

PROGRAM

— Racket sports : learning and improvement in badminton. — Artistic activities : discovery and hands-on experience in Acrosport. — Team sports : training and coaching in Volleyball, Beach Volleyball, or Basketball. — Water sports : initiation and improvement in Kayaking. — Physical fitness activities : introduction to general physical preparation and weight training. — Outdoor sports : initiation and improvement in Orienteering (CO) or climbing.

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : E3AG6PR2
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 4
Labs : 8
Total : 16

Project :
Personnal work :

ASSESSMENT

Continuous assessment, individual knowledge evaluation, oral presentations, report

TEACHING MATERIALS

Course materials provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-PROD

COURSE : Knowledge of tropical sectors

SCOPE OF THE COURSE

OBJECTIVES

Course objectives To understand current and emerging tropical agri-food sectors and the tools used to enhance these sectors.

Intended learning outcomes To know the main production and processing sectors for foods, both traditional and emerging, in tropical regions

To identify technological and biotechnological tools for valorizing tropical agro-resources, in line with agro-ecology goals and industrial performance to support the competitiveness of agri-food businesses.

COMPETENCE AND SKILLS

Select and size equipment based on the target finished product

PROGRAM

- Positioning of food production within sectors.
- Traditional and industrial processing in tropical environments.
- Current technological developments, notably addressing co-product valorization.
- Sectors, markets, valorization, stabilization, and control of variability in bio-molecules from fresh and processed tropical agroresources.
- Development potential of these resources with an impact on local economies.

The sectors studied will relate to the development of high-value-added products (coffee, vanilla, cocoa, aromatic plants); the sugar industry; cereals, roots, tubers, and starchy fruits; meats; ranges of fruits and vegetables. Teaching and seminars are provided by local agri-food professionals, academic researchers, and CIRAD researchers...

BIBLIOGRAPHY

REQUIREMENTS

Functional properties of foods; food safety; food engineering (unit operations, processes, and food preservation)

IDENTIFICATION

Course code : E3AG6PR3
ECTS : 1.5

DURATION

Lectures : 6
Tutorial classes : 14
Labs : 4
Total : 24

Project :
Personnal work :

ASSESSMENT

Continuous assessments and lab work grades

TEACHING MATERIALS

Course materials, tutorials, and lab work made available

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-PROD

COURSE : Control of Systems and Maintenance Management 1

SCOPE OF THE COURSE

OBJECTIVES

Course objectives To provide students with the fundamental knowledge necessary for implementing control of a process in the agri-food sector. Intended learning outcomes This course on system control and maintenance management is taught over the first two years of the engineering cycle. It aims to enable future agri-food engineers to : 1. Analyze in detail offers related to the automation of processes in the agri-food sector 2. Draft a specification sheet for the automation of an agri-food process 3. Establish and propose choices in terms of process control in the agri-food sector 4. Understand the basics of metrology and the different types of sensors useful for process control.

This first module includes : 8 hours (Lectures), 8 hours (Tutorials) for the control systems part and 4 hours (Lectures), 4 hours (Lab work) for the maintenance management part

COMPETENCE AND SKILLS

Conducting a test and verifying the proper operation of the production line

PROGRAM

For the Control of Systems 1 part, the proposed syllabus is as follows : - Introduction to system control - Examples of control in the Agri-Food sector - Metrology and sensors - Components of a control loop - Principles of open-loop and closed-loop control - Tools for system analysis. Transfer functions of systems - Study of first-order and second-order systems - Implementation of a first proportional correction

For the Maintenance Management 1 part, the proposed syllabus is as follows : - Discovering the scope of maintenance in an industrial plant - Discovering the energy sources used to operate a plant - Introduction to the most commonly used equipment for each type of energy - Introduction to different types of maintenance (preventive, corrective, predictive, etc.) - Studying the operation of a machine and analyzing the data required to create a maintenance plan - Studying the operation of a machine and drafting a first-level preventive maintenance plan

BIBLIOGRAPHY

- *Automatismes et procédés industriels agroalimentaires*, G. Trystram, Techniques de l'ingénieur.
- *Automatique*, C. Foulard, J.M. Flaus, M. Jacomino. Hermes, Paris, 1997.
- *Cours d'automatique*, M. Rivoire, J.L. Ferrier, Eyrolles, 1992.

REQUIREMENTS

Basic knowledge of systems, signals, and transfer functions from the integrated preparatory cycle

IDENTIFICATION

Course code : E3AG6PR4
ECTS : 2

DURATION

Lectures : 6
Tutorial classes : 18
Labs : 8
Total : 32

Project :
Personnal work :

ASSESSMENT

- Continuous assessments and practical work grade. - Case study on refrigeration machines. - Case study on air treatment. - Number of assessments : 3; 2 hours per continuous assessment; Final grade = 1/3 CA + 1/3 homework + 1/3 practical work (+ report).

TEACHING MATERIALS

Materials provided by the instructors involved in this module. Handouts/resources on refrigeration and air treatment systems (actual sizes used in the field) made available to students.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-PROD

COURSE : Complementary Physics

SCOPE OF THE COURSE

OBJECTIVES

- Understand the concepts of sizing refrigeration systems dedicated to food preservation and traceability monitoring;
- Understand and characterize air treatment issues;
- Evaluate selection criteria for coupled pumps and deduce potential energy efficiency in variable-flow models;
- Acquire basic knowledge of transport phenomena (thermal, mass, momentum, etc.) occurring during unit operations and treatment processes (preservation, transformation, etc.) to understand their operation;
- Understand and master fluid transfer sizing tools in the Agri-Food sector : viscous fluids, rheology, compressible fluids;
- Know and choose different pumps and compressors used in the agri-food industry.

COMPETENCE AND SKILLS

This course aims to enable the future agro-industrial engineer to :

- Establish a production flowchart;
- Select and size equipment based on the target finished product;
- Conduct a test and verify the proper operation of the production line.

PROGRAM

1. Motor and receiver cycles
2. Refrigeration and freezing (refrigeration machines and freezing/thawing rates)
3. Psychrometric chart (Psychrometry)
4. Mass transfer : diffusion (definition of concentration units, steady-state mass transfer (Fick's 1st law), transient mass transfer (Fick's 2nd law), diffusion in the transient regime, applications of mass transfer in food processes)
5. Mass transfer by convection (dimensionless numbers, calculation of mass transfer coefficients)
6. Study of simultaneous transfer phenomena (heat and mass).
7. Fluid transfer (internal flow in pipes, external flow, boundary layer analysis, velocity profiles, study of forces acting on fluids, pressure drops, friction).
8. Practical work (refrigeration machines, industrial site visit (as a complement to practical work carried out))

BIBLIOGRAPHY

- IEC 60034-30 standard for electric motors with 4 efficiency classes.
- Techniques de l'Ingénieur collection :
 - Fluid mechanics
 - Techniques de l'Ingénieur collection - Ref : A1870 v1

REQUIREMENTS

- Thermodynamics (First and Second Laws).
- Introduction to fluid mechanics.
- Basic understanding of psychrometric chart evolutions.

IDENTIFICATION

Course code : E3AG6QH1
ECTS : 0.5

DURATION

Lectures : 4
Tutorial classes : 10
Labs : 0
Total : 14

Project :
Personnal work :

ASSESSMENT

Final assessment, report grade

TEACHING MATERIALS

Course and practical work materials provided

LANGUAGE

English

CONTACT

Benjamin VEGAR

Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : TES 2 : Life Cycle Assessment

SCOPE OF THE COURSE

OBJECTIVES

- Understand the principles of LCA
- Understand how environmental impacts are measured
- Conduct and interpret an LCA

Objectives : The engineering student is able to consider environmental and sustainable development challenges. They understand the principles of Life Cycle Assessment (LCA), its contributions and limitations as a tool in the role of an engineer in the agri-food production sector. The engineering student is able to :
- Read and analyze an LCA, - Conduct a simplified LCA, - Analyze and present results, - Use LCA within an eco-design approach.

COMPETENCE AND SKILLS

Analyze and reduce the environmental impact at the scale of a product and a company

PROGRAM

1. Principles and definition of LCA
2. Interest and relevance of LCA (multicriteria, cross-cutting)
3. LCA method (definition of the study scope, presentation of the steps)
4. LCA modeling (software, analysis characteristics)
5. Impact assessment (GHG, water footprint, acidification, sensitivity analysis)
6. Scenario analysis and uncertainty management
7. Scenario creation and comparative analysis within an eco-design project framework.
8. Practical work » Building a model and analyzing results Learning outcomes : The engineering student is able to perform an LCA applied to a product or packaging using software. They understand the value of LCA as a cross-cutting and multicriteria approach.

BIBLIOGRAPHY

IDEONIS - Moodle Ecotrophelia Techniques de l'Ingénieur

REQUIREMENTS

Knowledge of sustainable development issues and eco-design solutions in the agri-food sector

IDENTIFICATION

Course code : E3AG6QH2
ECTS : 0.5

DURATION

Lectures : 6
Tutorial classes : 0
Labs : 0
Total : 6

Project :
Personnal work :

ASSESSMENT

Individual assessment Oral presentation

TEACHING MATERIALS

Course materials

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : TES 2 : New Economic and Governance Models

SCOPE OF THE COURSE

OBJECTIVES

This course aims to explore the transformations of economic models and governance practices in a context marked by environmental, social, and technological challenges.

COMPETENCE AND SKILLS

— Integrating the challenges of a just, equitable, and inclusive ecological transition

PROGRAM

— Historical influence of economic models on the sustainability of development
— Main emerging economic models supporting the sustainable development of territories (collaborative economy, circular economy, functional economy, etc.)
— Main corporate governance models and their evolution — Impact of digital, social, and societal transformation on emerging governance models

BIBLIOGRAPHY

Sustainable development of territories : the path of the functional economy and cooperation – ADEME

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG6QH3
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 8
Labs : 0
Total : 12

Project :
Personnal work :

ASSESSMENT

Individual assessment Oral presentation
Report submission

TEACHING MATERIALS

Course materials

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : Environmental Management in the Food Industry

SCOPE OF THE COURSE

OBJECTIVES

This course aims to improve water, energy, and waste management to reduce the environmental impact of food industry operations. It provides an introduction to environmental management.

COMPETENCE AND SKILLS

— Understand the obligations of food industry operators regarding the environment — Analyze and reduce the environmental impact at the product and company levels — Integrate the challenges of a fair, equitable, and inclusive ecological transition

PROGRAM

— Environmental regulations applicable in the food industry (ICPE, Water Framework Directive, RSDE, etc.) — Optimization of water cycles in industrial processes — Energy performance of industrial processes — Industrial waste management — Environmental impact assessment methodology and life cycle analysis — Environmental performance management

BIBLIOGRAPHY

Environmental Code, AIDA INERIS NF EN ISO 14001 Environmental management systems 2015 NF EN ISO 14005 Phases of implementation of an EMS 2019 NF EN ISO 14031 Environmental performance 2021

REQUIREMENTS

TES 1 : Anthropocene, climate-energy, biodiversity, resources TES 2 : Life cycle analysis

IDENTIFICATION

Course code : E3AG6QH4
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 4
Labs : 8
Total : 16

Project :
Personnal work :

ASSESSMENT

Continuous assessment Individual know-
ledge evaluation Lab report.

TEACHING MATERIALS

Course materials, tutorials and lab work
available

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : Toxicology

SCOPE OF THE COURSE

OBJECTIVES

Identify sources of intrinsic/extrinsic xenobiotics in food and their mode of action. Know applicable determination methods. Assess toxic risk and understand control measures within regulatory and normative contexts.

COMPETENCE AND SKILLS

Understand the main hazards related to the sanitary safety of a product

PROGRAM

- Toxicological risk
- Naturally occurring xenobiotics in food
- Atmospheric and water pollution
- Food contamination
- Risk assessment and control

BIBLIOGRAPHY

REQUIREMENTS

Structure of biomolecules General and analytical chemistry Quality and good laboratory practices. Analysis of chemical hazards and HACCP

IDENTIFICATION

Course code : E3AG6QH5
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 12
Labs : 6
Total : 22

Project :
Personnal work :

ASSESSMENT

Individual assessment Group report sub-
mission for lab work.

TEACHING MATERIALS

Course materials (PPT) provided.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : Evolution and modification of foods

SCOPE OF THE COURSE

OBJECTIVES

Master the steps and parameters of enzymatic and non-enzymatic degradation of foods, to control biochemical modifications in food engineering and improve the sensory and nutritional properties of products.

COMPETENCE AND SKILLS

Understand the different stages of food degradation (enzymatic, non-enzymatic, chemical...), understand the consequences of technological treatments on foods.

PROGRAM

Elements of reactivity ; Chemical and enzymatic treatments of foods ; Biochemical consequences of technological treatments on foods : Lipid oxidation ; Enzymatic browning Non-enzymatic browning ; Protein alterations (presentation of mechanisms, factors influencing reactions, consequences in food technology) ; Demonstration of these phenomena on products from major food sectors - Analytical methods for assessing reactions ; - Prevention strategies - Prediction of chemical and enzymatic alterations based on the water activity of a food.

BIBLIOGRAPHY

Oxidation reactions Available online : <https://www.techniques-ingenieur.fr/base-documentaire/procedes-chimie-bio-agro-th2/procedes-biochimiques-et-chimiques-en-agroalimentaire-42431210/modifications-biochimiques-des-constituants-aliments-f3400/reactions-d-oxydation-f3400niv10003.html>

REQUIREMENTS

Structure and properties of macronutrients (proteins, carbohydrates, lipids), food additives, and processing aids.

IDENTIFICATION

Course code : E3AG6QH6
ECTS : 1

DURATION

Lectures : 2
Tutorial classes : 8
Labs : 8
Total : 18

Project :
Personnal work :

ASSESSMENT

Individual knowledge assessment, group oral presentation

TEACHING MATERIALS

Course material

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : Shelf life of food products

SCOPE OF THE COURSE

OBJECTIVES

Determine the shelf life of a food product

COMPETENCE AND SKILLS

Know how to determine the shelf life of a food product using appropriate tools
- Understand the principles of predictive microbiology

PROGRAM

Definitions of microbiological shelf life, Use-by date (DLC) and Best-before date (DDM) - Use of tools for determining the shelf life of perishable foods : literature analysis, microbiological aging tests, challenge tests, predictive microbiology (Symprevius)

BIBLIOGRAPHY

Standard FD V01-014 Traceability and food safety - Management and hygiene - Recommendations for determining the microbiological shelf life of foods; Standard NF V01-003 September 2017 Traceability and food safety - Management and hygiene - Guidelines for conducting microbiological aging tests - Refrigerated perishable foods; Standard NF V01-009 May 2014 Traceability and food safety - Management and hygiene - Guidelines for conducting microbiological growth tests; ANSES opinion

REQUIREMENTS

Food safety, unit operations, processes and preservation, formulation and culinary engineering, food evolution and modification

IDENTIFICATION

Course code : E3AG6QH7
ECTS : 1.5

DURATION

Lectures : 6
Tutorial classes : 14
Labs : 0
Total : 20

Project :
Personnal work :

ASSESSMENT

Individual assessment Oral presentation
Submission of a report

TEACHING MATERIALS

Course materials Good practice guides
Standards

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-QHSE

COURSE : SDA : HACCP

SCOPE OF THE COURSE

OBJECTIVES

To know how to design, implement, and manage an HACCP system

COMPETENCE AND SKILLS

— Understand the obligations of food business operators regarding food safety
— Identify the main hazards associated with food — Develop a food safety assurance system based on the HACCP method — Analyze causes of non-compliance and propose appropriate corrective actions

PROGRAM

— Regulatory context : Hygiene Package and — Sanitary Control Plan — Implementation of good hygiene practices — The HACCP approach : 7 principles and 12 steps Phase 1 : Form the HACCP team Phase 2/3 : Describe the product, its distribution, and intended uses Phase 4/5 : Construct and confirm the process flow diagram Phase 6 : Identify, assess hazards, and define control measures Phase 7/8/9 : Determine PRPO / CCP and monitoring limits Phase 9 : Establish a monitoring system Phase 10/11 : Corrections, corrective actions, and verification procedures Phase 12 : Establish documentation and archiving

BIBLIOGRAPHY

Codex Alimentarius, European regulations (Hygiene Package) Good Hygiene Practice Guides (GBPH) ISO 22000 v2018, ISO-TS 22002-1, NFV01-006 v2022 (HACCP) standards From HACCP to ISO 22000 - Olivier BOUTOU, 2014, 3rd Edition - AFNOR DGAL, CERVIA, ACTIA guides, ANSES hazard sheets

REQUIREMENTS

Knowledge of the agri-food sector and Good Hygiene Practices. Food microbiology, unit operations, food shelf life.

IDENTIFICATION

Course code : E3AG6QH8
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 4
Labs : 0
Total : 4

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE6-QHSE

QHSE SAE

SCOPE OF THE CHALLENGE

WORKING SITUATION

COMPETENCES AND LEVEL ASSESSED

EXPECTED OUTPUTS

RESOURCES

IDENTIFICATION

Course code : E3AG6RD1
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 0
Total : 18

Project :
Personnal work :

ASSESSMENT

Survey report on an agro-food-related case study

TEACHING MATERIALS

Course support (PPT) Moodle

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : Survey Management

SCOPE OF THE COURSE

OBJECTIVES

Be able to collect and analyze information for problem-solving. Know how to design a questionnaire and analyze results.

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints (Nutri-Score, anti-waste law, etc.) Adapt and select product characterization methods (physicochemical, rheological, sensory, nutritional, shelf life) according to objectives Understand scientific and technical resources in English

PROGRAM

- Qualitative survey methods (individual and group interviews, observations) and quantitative methods (questionnaires, databases)
- Sampling : choosing sample size, understanding the principle of random and empirical surveys, identifying sources of error
- Questionnaire design (types of questions, wording and order, questionnaire adaptation to data collection mode, measurement errors, key legal issues (GDPR))
- Digital data collection tools (Google Forms, survey software such as SPHINX)
- Data processing : implementation of descriptive statistical and graphical tools to report survey results (mean, variance, standard deviation, confidence interval, diagrams, histograms, multivariate analyses)

BIBLIOGRAPHY

REQUIREMENTS

Management computing course. Descriptive statistics. Data analysis

IDENTIFICATION

Course code : E3AG6RD10
ECTS : 3

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 0
Total : 0

Project :
Personnal work :

ASSESSMENT

Framework Note Mid-term Defense Project
Report Oral Defense

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : Supervised Project + Skills Assessment
(English/Internship)

SCOPE OF THE COURSE

OBJECTIVES

Implement all knowledge in the food science and technology field to formulate a product (prototype) in partnership with a company in the sector.

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints (Nutri-Score, anti-waste law, etc.) Design and implement a simple experimental plan Formulate and process a product Adapt and select product characterization methods (physicochemical, rheological, sensory, nutritional, shelf life) according to objectives Understand scientific and technical resources in English

PROGRAM

On a project proposed by a company in the food industry, students (in pairs or threes) implement all the knowledge in the field to formulate a new product. Students must study, if possible, all aspects of developing a new product, namely : Establish a functional specification sheet Conduct a marketing study (market research) Carry out a bibliographic and regulatory synthesis Develop a formulation approach Evaluate product quality (physicochemical, nutritional, rheological characterization, preservation) Establish a product manufacturing flowchart Characterize and test the concept (analysis, sensory evaluation, cost study, positioning, sustainability assessment)

BIBLIOGRAPHY

REQUIREMENTS

Functional properties of foods Formulation Data Analysis 1 Product Analysis (analytical tools) Sensory evaluation Nutrition 1 General Accounting Applied Marketing in Food Industry Survey Management English Research and documentary monitoring (standards, patents, scientific publications) Eco-design Innovation methodology Unit operations Project management

IDENTIFICATION

Course code : E3AG6RD11
ECTS : 0

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 0
Total : 0

Project :
Personnal work :

ASSESSMENT

Regular individual interviews with a designated tutor teacher

TEACHING MATERIALS

Competency framework for the specialty
Deliverables from SAE (Situational Learning Activities) Computer tool supporting the portfolio

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : Individual follow-up / Portfolio

SCOPE OF THE COURSE

OBJECTIVES

The aim of this course is to support the engineering student in building their competency portfolio throughout their studies at the school, in order to develop their profile in line with their professional project.

COMPETENCE AND SKILLS

Develop the ability to know oneself, to self-assess, to manage one's skills (particularly with a view to lifelong learning), and to make professional choices

PROGRAM

- Understanding the competency-based approach and the portfolio tool
- Importing evidence elements (traces) justifying the validation of competencies acquired during the first year of the engineering cycle
- Reflection on the professional project : in which competency(ies) does the engineering student wish to build their career
- Potential enhancement of extracurricular activities
- Construction of the professional project (S5, 30 min)

BIBLIOGRAPHY

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REQUIREMENTS

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IDENTIFICATION

Course code : E3AG6RD2
ECTS : 2

DURATION

Lectures : 0
Tutorial classes : 20
Labs : 10
Total : 30

Project :
Personnal work :

ASSESSMENT

Internal assessment Situational exercises on professional skills At least 2 assessments per semester External assessment : TOEIC S8/S9

TEACHING MATERIALS

General English : Current affairs topics, press, internet Specialized English : Technical and scientific resources Professional English : CV, cover letter, email TOEIC past papers

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : English

SCOPE OF THE COURSE

OBJECTIVES

This course, taught in English, aims to develop pragmatic, sociocultural, and linguistic CEFR skills in the four language activities through varied teaching methods in interactive lectures, tutorials, and practical sessions. Activities include listening and reading comprehension, written productions (essays, summaries, memos, internship reports) and oral productions (presentations, group projects, improvisations, discussions, and debates) to prepare students for using English in a professional context while fostering critical thinking.

COMPETENCE AND SKILLS

- Understand spoken and written English
- Express oneself in writing
- Argue, explain, persuade, and nuance orally
- Use technical and scientific documents
- Prepare for the TOEIC : Level 2 (B1.2)

PROGRAM

- Understanding written and oral documents
- Writing a summary based on a series of oral and written documents
- Interaction, discussion, defending a point of view, debate
- Advanced grammatical correction – syntax, level 1 linking words, argumentative structures
- English rhythm and prosody
- Level 1 formal register

BIBLIOGRAPHY

Authentic written and oral documents, Internet, television resources, foreign press, digital tools, linguistic tools – Global Exam, British Council, BBC Learning English, VoA, monolingual dictionaries. TOEIC past papers. Websites of international and European organizations, both general and specific. General : UN, WHO, WEF, IMF, WTO, World Bank... Specific to the agri-food sector : FAO / FSA / IFST / HACCP / EFFoST

REQUIREMENTS

B1.1 CEFR Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise while travelling in an area where the target language is spoken. Can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.

IDENTIFICATION

Course code : E3AG6RD3
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 10
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

At least two continuous assessments.

TEACHING MATERIALS

Slides and guided work sheets.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : English or L2

SCOPE OF THE COURSE

OBJECTIVES

This course aims to develop students' linguistic, cultural, and communicative skills in a second foreign language (Chinese or Spanish). It focuses on acquiring language fundamentals, oral and written fluency, as well as discovering associated cultures, to prepare students for interactions in personal, professional, or academic contexts.

COMPETENCE AND SKILLS

- Communicate with various stakeholders (clients, management, users, IT managers, regulatory bodies—CNIL, ANSSI—) in writing and orally
- Ensure effective communication with stakeholders, including clients, administrations, citizens, and civil society.

PROGRAM

1. Linguistic initiation

- Basic grammatical structures : present indicative, adjectives, pronouns.

2. Oral communication

- Techniques to improve pronunciation and oral fluency.

3. Written comprehension and expression

- Writing simple letters or emails (self-introduction, information requests).

4. Linguistic and intercultural deepening

- Study of songs, poems, or literary excerpts adapted to the level.

5. Practical project and continuous assessment

- Regular oral and written evaluations to monitor progress.

BIBLIOGRAPHY

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REQUIREMENTS

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IDENTIFICATION

Course code : E3AG6RD4
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 0
Total : 18

Project :
Personnal work :

ASSESSMENT

Final group assessment

TEACHING MATERIALS

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anasthase.tangamoutou@univ-reunion.fr

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : General Accounting

SCOPE OF THE COURSE

OBJECTIVES

Identify the purposes and users of accounting information Ability to consider company challenges; ability to communicate with accounting specialists and various company stakeholders Knowledge of key accounting documents and their framework of use Understanding of the principles and methods of general accounting, as well as the international approach to financial reporting standards

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints Formulate and transform a product

PROGRAM

— Basic general accounting and Anglo-Saxon accounting approach — Common transactions : purchases, sales, operating cycle, investment cycle, and financing cycle — Inventory : stock variations, depreciation, provisions, impairments — Summary documents : Balance sheet, income statement, cash flow statement

BIBLIOGRAPHY

- 1) DCG 9 - Comptabilité – Conforms to PCG 2025 (Order of December 26, 2023, approving ANC regulations) by Pascale Recroix
- 2) Encyclopédie de comptabilité, contrôle de gestion et audit (2nd edition) - Bernard Colasse

REQUIREMENTS

None

IDENTIFICATION

Course code : E3AG6RD5
ECTS : 1

DURATION

Lectures : 2
Tutorial classes : 6
Labs : 8
Total : 16

Project :
Personnal work :

ASSESSMENT

Final exam, report grade, practical work
report grade

TEACHING MATERIALS

Course, TD and TP materials provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : Eco-design

SCOPE OF THE COURSE

OBJECTIVES

- Understand environmental issues related to the agri-food industry
- Understand the origins of current environmental impacts
- Understand action levers using eco-design

Objectives : The engineering student understands the challenges of sustainable development. They are familiar with various eco-design solutions and the regulatory framework related to eco-design. They can integrate sustainable development concepts when developing a formulation or product innovation project, including its packaging.

COMPETENCE AND SKILLS

Develop a simple specification sheet based on predefined constraints (Nutri-Score, anti-waste law, etc.) Formulate and transform a product Understand scientific and technical resources in English

PROGRAM

- Impact of the agri-food industry on the environment (introduction : urbanization, intensive livestock farming, major challenges for the industrial sector, societal issues, health aspects)
- Regulatory context : scope of application
- Environmental labeling and indicators (Grenelle Laws 1 and 2)
- Eco-design solutions (at consumption and production levels)
- Drivers and barriers to eco-design today
- Focus on eco-design of packaging (packaging development stages, environmental impacts related to these stages, how to limit these impacts, understanding the 3Rs (Reduce, Reuse, Recycle...) and their limits, integrating eco-design into packaging development)
- Practical work (linked to LCA) : Eco-design practical work using LCA software applied to packaging

BIBLIOGRAPHY

IDEONIS - moodle ecotrophelia Lexicon of eco-innovative project management : <http://fr.calameo.com/read/004835995a022b362ac5d> Techniques de l'ingénieur

REQUIREMENTS

Basic knowledge in quality and food analysis Basic knowledge of packaging functions

IDENTIFICATION

Course code : E3AG6RD6
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 12
Labs : 8
Total : 24

Project :
Personnal work :

ASSESSMENT

Individual knowledge assessment
Submission of a group report for the practical work.

TEACHING MATERIALS

Course materials (PPT) provided.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE6-R

COURSE : Sensory evaluation

SCOPE OF THE COURSE

OBJECTIVES

Determine the organoleptic properties of foods; Implement sensory evaluation methods; Assess consumer perception and support innovation processes; Panel training; software use.

COMPETENCE AND SKILLS

Understand different sensory evaluation tests; depending on needs, know how to select the appropriate test; know how to implement sensory evaluation tests; know how to analyze results and statistics from the tests conducted.

PROGRAM

Definitions of sensory evaluation, sensory analysis, hedonic analysis; Fields of application of sensory evaluation in the agri-food sector. - Principles of sensory perception, knowing how to define the appearance, odor, taste, aroma, and texture of a food. Best practices for conducting a sensory evaluation : sensory analysis room, questionnaire, response scales, panel recruitment. - Choosing your approach : analytical or hedonic, different sensory evaluation tests. Reporting on a sensory evaluation : the test report. Developing questionnaires, mastering different tests, statistical data processing, and introduction to the Tastel software will be covered in tutorials. During practical work, students will organize and adapt a sensory evaluation (sensory or hedonic analysis), which will include developing questionnaires, recruiting a panel, and preparing products/samples. They must be able to recognize odors, tastes, and aromas, describe a food (ingredients, aroma, etc.) or improve it. Students must also be able to process data and present a test report for an agri-food company.

BIBLIOGRAPHY

From perception to sensory measurement, Fortin Jacinthe and Durand Nathalie, Lavoisier, 2004; Sensory evaluation of food : principles and practices, Harry T. Lawless, Hildegard Heymann, Springer, 2010; Sensory evaluation practices, Third Edition, Herbert Stone, Joel L Sidel, Elsevier Academic Press, 2004.

REQUIREMENTS

Properties of food constituents; Formulation, innovation methodology; Experimental design, data analysis.

IDENTIFICATION

Course code : E3AG6RD7
ECTS : 1

DURATION

Lectures : 2
Tutorial classes : 8
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

Continuous assessment

TEACHING MATERIALS

Handout Moodle

LANGUAGE

English

CONTACT

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UE : UE6-R

COURSE : Data Analysis 1

SCOPE OF THE COURSE

OBJECTIVES

This course aims to equip engineering students with the knowledge needed to design experimental campaigns and analyze their results. They will be able to identify key factors and identify main trends, while supporting their results with information on the inherent uncertainty in this analysis. Be able to conduct these analyses using a specialized numerical tool : R.

COMPETENCE AND SKILLS

Design and implement a simple experimental plan Adapt and select product characterization methods (physicochemical, rheological, sensory, nutritional, shelf life) based on objectives

PROGRAM

Statistical tests : Goodness-of-fit tests : Pearson's chi-squared test, Kolmogorov-Smirnov test Parametric comparison tests : T-test, ANOVA Non-parametric comparison tests : Mann-Whitney test, Wilcoxon test, Kruskal-Wallis test, chi-squared test Correlation tests : Pearson's test, Spearman's test, Kendall's test Experimental designs : Introduction. Full factorial design. Example. Responses. Factors. Levels. Main effects and interaction effects. Representation. Iso-response curves.

BIBLIOGRAPHY

Husson, François, Sébastien Lê, and Jérôme Pagès. *Analyse de données avec R*. Presses universitaires de Rennes, 2016. *Introduction aux plans d'expériences*, Jacques Goupy, Dunod, 2017.

REQUIREMENTS

Mathematical foundations in analysis, algebra and geometry; probability, descriptive and inferential statistics; Practice with a programming language (R)

IDENTIFICATION

Course code : E3AG6RD8
ECTS : 3

DURATION

Lectures : 6
Tutorial classes : 16
Labs : 30
Total : 52

Project :
Personnal work :

ASSESSMENT

Continuous assessments, report grades,
lab work report grades

TEACHING MATERIALS

Course materials, tutorials and lab work
handouts will be made available

LANGUAGE

English

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UE : UE6-R

COURSE : Analytical tools for the product

SCOPE OF THE COURSE

OBJECTIVES

To know and be able to apply analytical methods/tools for characterizing a product or food To understand the rheophysical behavior of food products according to processing steps

COMPETENCE AND SKILLS

To adapt and select product characterization methods (physicochemical, rheological, sensory, nutritional, shelf life) based on objectives To understand scientific and technical resources in English

PROGRAM

1. Main methods for physicochemical analysis

- a) Nuclear Magnetic Resonance (NMR) : General principles Spectrum analysis Applications of the technique in the agri-food sector
- b) Mass spectrometry General principles Applications in the agri-food sector
- c) Chromatographic methods Principles Thin-layer chromatography Column separation methods Gas chromatography HPLC
- d) Global methods pH measurement, titratable acidity Water activity Aw / moisture content Brix measurement and sugar content Color analysis

2. Acquisition of basic knowledge in rheology :

- Rheological quantities (deformation, shear, elasticity...)
- Texture analysis (tools : viscometer, texturometer...)
- Behavior of food fluids, rheology of solids, gels and food powders
- Applications in the agri-food sector (example : extrusion and extrusion cooking process)

Lab work : - Measuring food texture and color - Analyzing food constituent biomolecules using various techniques (pH-metric titrations and spectrophotometry, HPLC, NMR, mass spectrometry).

BIBLIOGRAPHY

REQUIREMENTS

Knowledge of biochemistry of biological molecules, organic chemistry, fluid mechanics

IDENTIFICATION

Course code : E3AG6RD9
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 4
Labs : 0
Total : 4

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE6-R

R&D SAE

SCOPE OF THE CHALLENGE

WORKING SITUATION

COMPETENCES AND LEVEL ASSESSED

EXPECTED OUTPUTS

RESOURCES

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE1-EC1
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 12
Labs : 0
Total : 12

Project :
Personnal work :

ASSESSMENT

Performance tracking and establishment of personal objectives.

TEACHING MATERIALS

Documentation

LANGUAGE

English

CONTACT

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UE : UE7-PROD

COURSE : Sports

SCOPE OF THE COURSE

OBJECTIVES

This course aims to promote health, well-being, and the values of sports through varied physical activities, while strengthening students' ability to work in teams and push their limits. Through a variety of sports and cooperative games, students will be encouraged to develop essential interpersonal skills such as communication, collaboration, and leadership.

COMPETENCE AND SKILLS

- Communicate orally, adapting to the technical knowledge level of interlocutors
- Organize the project according to project management methodologies

PROGRAM

- Physical initiation and preparation
- Team sports and team spirit
- Individual sports and personal development
- Health and prevention

BIBLIOGRAPHY

- Jonny Wilkinson, *The Winning Mind*, 2012
- Mike Horn, *Dare to Reach the Stars*, 2016
- Grégoire Chevignard, *From My Couch to the World's Toughest Race*, 2018

REQUIREMENTS

No prerequisites.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE1-EC2
ECTS : 2

DURATION

Lectures : 10
Tutorial classes : 14
Labs : 0
Total : 24

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

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UE : UE7-PROD

COURSE : Logistics Systems

SCOPE OF THE COURSE

OBJECTIVES

The Logistics Systems course aims to provide engineering students with the knowledge and tools necessary to analyze, design, and optimize physical and information flows within an agri-food production system. It enables understanding the interactions between production, procurement, storage, and distribution, in a logic of industrial performance and adaptation to the specific constraints of insular systems.

COMPETENCE AND SKILLS

Upon completion of the module, the student will be able to : • Analyze and model the physical and information flows of a production system • Identify and optimize logistics flows (procurement, production, distribution) • Manage inventory and size procurement policies • Use planning tools (MPS, MRP, ERP integration) • Understand the integration of logistics systems within an ERP • Consider specific constraints of the agri-food sector (perishable products, traceability, regulations) • Integrate industrial performance and supply chain challenges

PROGRAM

1. Introduction to logistics systems (supply chain, physical and information flows, challenges in agri-food, insular constraints and perishable products)
2. Production planning (MPS, MRP, forecast-production alignment, ERP introduction)
3. Organization of production systems (types of production, manufacturing routings, capacity-load, production/logistics link)
4. Inventory management (role and types, safety stock, reorder point, cost/service trade-off)
5. Procurement and distribution (procurement strategies, supplier management, inbound/outbound flows, downstream logistics)

BIBLIOGRAPHY

• Christopher M., *Logistics and Supply Chain Management*, Pearson • Courtois A., Pillet M., *Gestion de production*, Éditions d'Organisation • Baglin G. et al., *Management industriel et logistique*, Economica • Fender M., Pimor Y., *Logistique & Supply Chain*, 7th edition, Dunod, 2016 • Le Moigne R., *Supply Chain Management*, Dunod, 2017

REQUIREMENTS

Basics in production management Notions of industrial systems Basics in applied mathematics Project management

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE1-EC3
ECTS : 3

DURATION

Lectures : 16
Tutorial classes : 14
Labs : 8
Total : 38

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

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Modifié le : 14 juillet 2026

UE : UE7-PROD

COURSE : Sizing

SCOPE OF THE COURSE

OBJECTIVES

This course aims to prepare students for the technical, economic and organizational challenges related to the design, sizing and modernization of agri-food production units. It seeks to master food processing methods, design and size a plant in its entirety (process, building and utilities), optimize material, energy and logistics flows, integrate health, environmental and regulatory constraints, and support industrial decision-making, particularly regarding investment and technological choices.

COMPETENCE AND SKILLS

The design of an agri-food unit, as a strategic project integrating process, building and industrial organization, aims to develop skills in process control and standards, as well as project management, particularly in planning, budget management and activity coordination. Students also acquire skills in sizing (material and energy balances, equipment, utilities), industrial design (specifications, PFD/P&ID diagrams, layout, site selection) as well as techno-economic analysis and performance optimization, integrating technological innovations.

PROGRAM

Introduction to the sizing of agri-food units, as well as location and selection of industrial sites, taking into account essential criteria, and the design methodology through the basic file (objectives, constraints and strategic orientations) with a specifications methodology, the simplified preliminary project (APS) and the detailed preliminary project (APD), team building.

Development of technical basic files : descriptive sheets for inputs and outputs, the process, equipment, functional connections, hygiene or sanitation plan.

Selection of an industrial site : economic, techno-economic and regulatory parameters.

Flows : review of production flow management, technologies, constraints and storage, sizing and layout rules for premises, building layout approach.

Fluids and energy.

— Additional technical files — Technical information management ; Maintenance ; Applied hygiene regulations.

Consideration of storage and logistics, waste and wastewater management, environmental aspects, energy and its optimization, as well as safety, personnel and site monitoring. Presentation of design phases : conceptual phase (PFD, layout, UFD), preliminary phase (P&ID, sizing) and final phase (execution plans), integrating economic and regulatory parameters. Selection of equipment (transport, separation, mixing, thermal processes, drying, concentration/evaporation, packaging, etc.) and industrialization of food products, including the enhancement of traditional Réunionese products, their transformation into industrial processes, technological innovation and the development of exportable products. Design and develop sustainable agri-food activities. Eco-design food products by integrating sustainability and environmental respect principles.

BIBLIOGRAPHY

Alimentec Industries (1994). *Réussir votre usine agro-alimentaire : De la décision d'investir à la rédaction du cahier des charges*, technique et documentation. Charvolin, M., Duchet, M., & FEIGEL, G. (2006). *Conception des lieux et des situations de travail*. INRS Lopez-Fellows, Peter ; Axtell, Barrie (2005). *Créer et gérer une petite entreprise agroalimentaire*, GRET, 277 p. Gomez A. (2005). *Food Plant Design*, Taylor and Francis. Maroulis Z. and Saravacos G. (2007). *Food Plant Economics*, CRC Press Pignault J. and Sohier L. (1997). *Conception des unités de production ou de transformation*, techniques de l'ingénieur. RIA. Paris (1992). *L'usine agro-alimentaire : guide de conception et de réalisation*, CRITT IAA Idf

REQUIREMENTS

Food process engineering, Complementary physics, Automation/Maintenance, Production and logistics management, Quality approach, Project management, Basic knowledge in market studies, Competitor analysis.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE1-EC4
ECTS : 2

DURATION

Lectures : 6
Tutorial classes : 8
Labs : 10
Total : 24

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

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UE : UE7-PROD

COURSE : Production Management 2

SCOPE OF THE COURSE

OBJECTIVES

Deepen the concepts, methods, and tools of production management applied to agri-food industrial systems. Enable mastery of production control in a constrained environment, integrating technical, organizational, economic, quality, regulatory, and human dimensions. Deepen the principles of planning, scheduling, and production control; Analyze the performance of a production system using appropriate indicators; Understand the specific constraints of agri-food production; Integrate the challenges of industrial competitiveness, quality, cost control, deadlines, and resources; Use continuous improvement and Lean management tools in a sustainable performance logic.

COMPETENCE AND SKILLS

Analyze the organization and operation of an agri-food production system; Establish and use a production flow mapping; Build a production schedule taking into account capacity constraints, resource availability, quality requirements, and deadlines; Propose a coherent scheduling at the scale of a workshop or a production line; Size production resources based on target throughput, yield, and productivity objectives; Monitor, interpret, and use industrial performance indicators; Identify malfunctions, losses, and bottlenecks in a production system; Formulate proposals for technical, organizational, and economic improvements; Integrate quality, hygiene, food safety, and traceability requirements into production management; Conduct a critical analysis of a production line or workshop according to Lean management and continuous improvement principles.

PROGRAM

1. Deepening the fundamentals of production management
2. Production planning and control
3. Scheduling and operational flow management
4. Industrial performance management
5. Production management in the agri-food sector
6. Quality control in production
7. Lean management and continuous improvement

BIBLIOGRAPHY

REQUIREMENTS

Fundamental knowledge in production management acquired in the 3rd year; Basic concepts in industrial organization; Knowledge in accounting and business management; Basics in applied mathematics and statistics; General knowledge of processes and agri-food transformation systems.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-
S7-UE1-EC5
ECTS : 2

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 8
Total : 26

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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UE : UE7-PROD

COURSE : Control of Systems and Maintenance Management 2

SCOPE OF THE COURSE

OBJECTIVES

Control of Systems 2 : Taught over 2 years, this course aims to enable the future Agri-food Engineer to :

- Analyze in detail tenders related to the automation of processes in the agri-food industry.
- Draft a specification for the automation of a process.
- Propose technical and/or organizational solutions for process control in the agri-food industry.

Maintenance Management 2 : Taught over 2 years, this course aims to enable the future Agri-food Engineer to :

- Analyze technical documentation of a machine and define the machine's maintenance and control plan.
- Implement and define the safety control plan
- Analyze maintenance history data to implement continuous improvement actions
- Gain a foundation in the Total Productive Maintenance method

COMPETENCE AND SKILLS

to be completed

PROGRAM

For the Control of Systems 2 part, the proposed program is as follows :

- Quick recap of the components of a control loop
- Analysis of the stability of a control loop (Routh criterion)
- Study of the performance (speed/accuracy) of a control loop
- Design and implementation of PID controllers.
- Application to the control of a process in the Agri-food industry
- Control of physical quantities such as temperature, motor speed will be proposed in practical work.

For the Maintenance Management 2 part :

- Recap of different types of maintenance in industry
- Defining what falls under preventive, corrective, and improvement maintenance
- Updating a preventive maintenance plan from maintenance history
- Implementing an improvement based on maintenance history
- Understanding the operation of safety on a machine and creating a control plan

BIBLIOGRAPHY

REQUIREMENTS

Course (S6) Control and Maintenance Management 1

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE1-EC6
ECTS : 4

DURATION

Lectures : 15
Tutorial classes : 45
Labs : 0
Total : 60

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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UE : UE7-PROD

COURSE : Food Process Engineering 2

SCOPE OF THE COURSE

OBJECTIVES

The aim of this module is to provide in-depth expertise on complex unit operations for food transformation and stabilization. It covers conventional and emerging technologies (conventional, innovative, nanotechnologies), specific tropical sectors (such as sugar, starches, milk, etc.), and the use of digital tools (modeling, simulation, image analysis) to optimize processes according to multi-objective criteria (quality, economy, safety).

COMPETENCE AND SKILLS

Upon completion of this course, the student will be able to : - Design conventional thermal processing equipment, separation units (settling, centrifugation, membrane processes), evaporation-concentration systems, and drying processes (spray drying, freeze-drying). - Compare and select innovative stabilization processes (thermal and non-thermal) based on the food matrix. - Calculate and optimize mass and energy balances for a complete process. - Analyze food products using industrial vision (ImageJ) for quality control. - Develop and simulate mathematical models (deterministic, empirical, etc.) of mass/heat transfers using numerical tools (Matlab, Python, Comsol) applied to stabilization, preservation, and agro-food transformation processes.

PROGRAM

1. Unit operations and processes
2. Separation processes (extraction, membranes, settling, centrifugation)
3. Stabilization processes via evaporation-concentration
4. Dehydration processes (spray drying, freeze-drying, convective air drying)
5. Food product texturing (granulation, extrusion)
6. Innovative food processing technologies (alternative thermal processes (microwaves, infrared radiation, ohmic heating, ...))
7. Non-thermal food processing technologies (irradiation, homogenization, ultrasound, pulsed electric fields, high pressure, pulsed light)
8. Sugar technology : steps in sugar production processes (extraction of sugarcane and sugar beet juice, juice purification, evaporation, crystallization, sugar separation, drying and packaging) and calculations related to the different manufacturing stages, equipment used
9. Applications of nanotechnology in the food industry (nanotechnology basics, nanoparticle fabrication, micro and nanoemulsions, nano-encapsulation)
10. Multi-criteria optimization of processes (trade-offs between nutritional, sanitary, sensory, technical, and economic quality)
11. Digital images, processing and analysis for industrial applications (image acquisition, lighting, sensors and ImageJ software)
12. Modeling in food industries (mathematical models based on balances and mass/energy transfers, empirical models, process optimization)
13. Numerical simulation and software (Comsol Multiphysics, Matlab and Python) : Introduction to solving transfer equations in Matlab/Python and introduction to finite elements with Comsol Multiphysics.

BIBLIOGRAPHY

- Jeantet, R., et al. (2021). *Food Process Engineering Applied to the Agri-Food Industry* (Vol. 1 & 2). Lavoisier.
- Mafart, P. (2010). *Food Industrial Engineering : Unit Operations*.
- Berk, Z. (2018). *Food Process Engineering and Technology*. Academic Press.
- Singh, P. & Dennis Heldman. (2004). *Introduction to Food Engineering*, Fourth Edition.
- Sun, D. W. (2014). *Emerging Technologies for Food Processing*. Academic Press.

REQUIREMENTS

- Biology/Microbiology/Biochemistry : Microorganism structure and basics of bacterial growth.
- Physics/Chemistry : Concepts of temperature, heat, pressure, and simple mass balances.
- Applied Mathematics or Math Complements : Use of logarithmic and exponential functions, graph reading.
- Physics Complements.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE1-EC7
ECTS : 2

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 24
Total : 24

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE7-PROD

COURSE : Practical work in food process engineering

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE3-EC1
ECTS : 1

DURATION

Lectures : 2
Tutorial classes : 8
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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UE : UE7-QHSE

COURSE : Strategy

SCOPE OF THE COURSE

OBJECTIVES

Provide engineering students with a general culture of strategy. Understand how an organization or a territory defines its objectives and priorities. Situate strategic choices within an economic, technological, and geopolitical context. Present the role of innovation, clusters, networks, and competitiveness. Introduce simple strategic analysis tools. Apply these concepts in practical work on concrete topics worked on in groups.

COMPETENCE AND SKILLS

Define the concepts of strategy, objective, positioning, and competitive advantage. Identify the economic, technological, and geopolitical factors influencing a strategy. Understand the role of innovation in competitiveness. Explain the concepts of incubation, seed funding, patent, proof of concept, and TRL. Understand the role of clusters, R&D, RDI, and ecosystems. Identify key actors, networks, and partnerships useful for a strategy. Use simple tools : SWOT, PESTEL, stakeholders, SBUs. Analyze a sector, a technology, a public policy, or a territory. Formulate simple recommendations based on a structured diagnosis. Present a clear, well-argued, and concise analysis orally.

PROGRAM

Introduction : major characteristics of the contemporary economy. Definition of strategy : vision, objectives, means, resources, and priorities. Corporate, territorial, industrial, and public strategies. Innovation : innovation chain, R&D, transfer, and industrialization. Incubation, seed funding, proof of concept, patents, and intellectual property. TRL, technological maturity, and innovation financing. Clusters : definition, specialization, competitiveness, and key sectors. Networks : cooperation, multilateral organizations, and economic integration. Strategic analysis tools : SWOT, PESTEL, stakeholders, SBUs. TD : selecting a strategic topic and framing the issue. TD : diagnosis, documentary research, and recommendations. TD : report, oral presentation, and group discussion.

BIBLIOGRAPHY

Porter M. E., *Competitive Strategy*, Free Press. Porter M. E., *The Competitive Advantage of Nations*, Free Press. Rumelt R. P., *Good Strategy / Bad Strategy*, Profile Books. Mintzberg H., Ahlstrand B., Lampel J., *Strategy Safari*, Free Press. Christensen C. M., *The Innovator's Dilemma*, Harvard Business Review Press. European Commission, France Stratégie, OECD, Bpifrance Le Lab : reports on innovation and competitiveness.

REQUIREMENTS

No specific disciplinary prerequisites are required. A general knowledge of economics, innovation, and business organization is useful. Key concepts are reviewed during the course. Students must be able to research and select reliable information. They must be able to work in groups and present a structured analysis.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE3-EC2
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 0
Total : 18

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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UE : UE7-QHSE

COURSE : Labour and Business Law

SCOPE OF THE COURSE

OBJECTIVES

The course aims to understand the challenges of the business world

COMPETENCE AND SKILLS

Analyze and optimize the company's contractual processes Draft and propose contracts Secure an organization's contractual relationships

PROGRAM

General Introduction – Contract Negotiation Labour Law : - Fundamental principles of legal standards in labour law - Types of contracts : formation, execution, remuneration - Specific contractual clauses - Contractual disputes Business Law : - Legal requirements in business operations - Legal organization of the company - Hierarchy of legal standards in business law - Supply and service contracts - Corporate failures : prevention and collective procedures

BIBLIOGRAPHY

Paul-Henri Antonmattei (2025), *Labour Law*, 5th edition, Précis DOMAT Frédéric Buy (2023), *Business Contract Law*, Précis DOMAT Paul Le Cannu and Bruno Dondero (2025), *Corporate Law*, Précis DOMAT Marie-Hélène Raynier (2020), *Business Law : General Commercial Law and Competition Law*, Éditions Archétype

Online resources and subscriptions Code du travail numérique : <https://code.travail.gouv.fr>
<https://www.legifrance.gouv.fr> Revue fiduciaire : social et la vie des affaires : <https://revuefiduciaire.grouperf.com> <https://www.pappers.fr>

Digital resources : Code du travail numérique (Ministry of Labour) Revue des affaires Annotated Labour Code (2026) Légifrance : CCN Pappers

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE3-EC3
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 12
Labs : 0
Total : 16

Project :
Personnal work :

ASSESSMENT

1 individual grade 1 project grade

TEACHING MATERIALS

Course materials Regulations and standards

LANGUAGE

English

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Modifié le : 14 juillet 2026

UE : UE7-QHSE

COURSE : Quality and Performance Management

SCOPE OF THE COURSE

OBJECTIVES

To know how to design, implement, and manage a quality and performance management system

COMPETENCE AND SKILLS

— Analyze the internal and external context of an organization — Determine strategic orientations, policies, and objectives of an organization — Design and describe a management system through the process approach — Identify, assess, and control QHSE risks at the process level — Develop a global performance management system (QHSE/CSR)

PROGRAM

— History and concepts of quality — Implementing ISO 9001 :2015 certification — Analyzing a context, defining a strategy, and drafting a quality policy — Mapping and describing processes (SIPOC, risk analyses, monitoring) — Improving operational performance — Quality toolbox – Lean Management (5S, Kaizen, SMED, Just-in-Time, Kanban, Agile methods, etc.)

BIBLIOGRAPHY

— *La boîte à outils de la qualité* – 4th ed., Broché – Grand livre, February 5, 2020
— *Les outils de la performance industrielle*, Eyrolles Edition, March 2008 — ISO 9001, ISO 9002, ISO 9004 standards — EFQM Model

REQUIREMENTS

General knowledge of business Information research / bibliography Project management (PDCA, GANTT planning) Problem-solving methods

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-
S7-UE3-EC4
ECTS : 1.5

DURATION

Lectures : 22
Tutorial classes : 0
Labs : 0
Total : 22

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE7-QHSE

COURSE : TES 3 : OSH, CSR, Engineering Ethics

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-
S7-UE3-EC5
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 0
Labs : 0
Total : 4

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE7-QHSE

SAE QHSE

SCOPE OF THE CHALLENGE

WORKING SITUATION

COMPETENCES AND LEVEL ASSESSED

EXPECTED OUTPUTS

RESOURCES

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE2-EC1
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 0
Labs : 16
Total : 20

Project :
Personnal work :

ASSESSMENT

deliverables and presentations

TEACHING MATERIALS

Mission support, data, guides, reports...

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE7-R

COURSE : Innovation competition

SCOPE OF THE COURSE

OBJECTIVES

integrating technological innovations

COMPETENCE AND SKILLS

mobilizing and combining tools related to innovation methodology acquired in the resources, learning to learn (completing the tools...), working in a project group (shared reflexivity, autonomy, time and stress management...), communicating and convincing

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

Project management, survey management, marketing, creativity methods. These prerequisites are acquired beforehand in the program's resources or during the year through autonomous or guided learning.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE2-EC2
ECTS : 2

DURATION

Lectures : 0
Tutorial classes : 20
Labs : 10
Total : 30

Project :
Personnal work :

ASSESSMENT

2 Continuous assessments + 1 presentation + an average of homework assignments + Mock TOEIC.

TEACHING MATERIALS

Adaptive and varied materials aligned with the skills.

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE7-R

COURSE : English

SCOPE OF THE COURSE

OBJECTIVES

Deepen oral comprehension strategies : Authentic documents and TOEIC. Structure technical discourse in writing - 500 words.

COMPETENCE AND SKILLS

Listening comprehension. Written expression.

PROGRAM

Pragmatic competence : Interactive oral communication through appropriate tasks. Writing a scientific and technical report (Project : study trip). Summary of a technical video : Cross-disciplinary skills.

Socio-linguistic competence : Language register : Scientific English. American register and different accents - Different Englishes.

Linguistic competence : Vocabulary : Technical and scientific lexical field. Business English : meetings, orders, invoicing, deliveries. Phonology : Specific English phonemes in different parts of the world. Rhythm : sentence stress, prosody. Grammar : Verb group - Mastering grammatical analysis of an English sentence. Complex sentences, idiomatic expressions.

BIBLIOGRAPHY

Maroulis Z. and Saravacos G. (2007). Food Plant Economics, CRC Press

REQUIREMENTS

Level B2 in progress.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-
S7-UE2-EC3
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 10
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE7-R

COURSE : English or L2

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE2-EC4
ECTS : 1

DURATION

Lectures : 2
Tutorial classes : 2
Labs : 6
Total : 10

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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UE : UE7-R

COURSE : Data Analysis 2

SCOPE OF THE COURSE

OBJECTIVES

This course aims to equip student-engineers with the knowledge needed to design experimental campaigns and analyze their results. They will be able to identify key factors and identify main trends, while supporting their results with information on the inherent uncertainty in this analysis. To be able to conduct these analyses using a specialized numerical tool : R.

COMPETENCE AND SKILLS

PROGRAM

- Statistical tests : Goodness-of-fit tests : Pearson's Chi-squared test, Kolmogorov-Smirnov test Parametric comparison tests : T-test, ANOVA Non-parametric comparison tests : Mann-Whitney test, Wilcoxon test, Kruskal-Wallis test, Chi-squared test Correlation tests : Pearson's test, Spearman's test, Kendall's test
- Experimental designs : Introduction. Full factorial design. Example. Responses. Factors. Levels. Main effects and interaction effects. Representation. Iso-response curves.

BIBLIOGRAPHY

Husson, François, Sébastien Lê, and Jérôme Pagès. *Analyse de données avec R*. Presses universitaires de Rennes, 2016. *Introduction aux plans d'expériences*, Jacques Goupy, Dunod, 2017.

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S7-UE2-EC5
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 14
Labs : 0
Total : 14

Project :
Personnal work :

ASSESSMENT

Continuous assessment

TEACHING MATERIALS

Course materials provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE7-R

COURSE : Prospective foods and regulations

SCOPE OF THE COURSE

OBJECTIVES

Be able to balance food innovation and regulatory compliance to address the challenges of the food transition

COMPETENCE AND SKILLS

Generate an innovative product idea, analyze its environment, and identify a market opportunity Research resources, synthesize, and present the work carried out in English, using appropriate statistical tools

PROGRAM

Perspective on applicable regulations in relation to key areas of food innovation. This includes general/collective food and foods intended for specific diets, based on nutrition and human physiology foundations

BIBLIOGRAPHY

REQUIREMENTS

Nutrient needs and intakes ; Functional properties of foods ;

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-
S7-UE2-EC6
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 0
Total : 18

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Cyrielle GARCIA
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Modifié le : 14 juillet 2026

UE : UE7-R

COURSE : General Marketing

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC1
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 12
Labs : 0
Total : 12

Project :
Personnal work :

ASSESSMENT

Minimum 1 continuous assessment

TEACHING MATERIALS

N/A

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Sports

SCOPE OF THE COURSE

OBJECTIVES

- Develop and improve health
 - Engage in effort (intensity/duration)
 - Analyze and understand the causes and effects of an action
- Gain self-awareness
 - Discover physical and mental resources and abilities
 - Boost self-confidence by working on self-esteem

COMPETENCE AND SKILLS

- Develop and mobilize personal resources (emotional/physical) to enhance motor skills, make them effective, and foster success
- Develop methodological knowledge for organizing and managing risks and safety related to practices
- Develop leadership skills (managing a group, justifying decisions, showing kindness, fostering a climate of trust and collaboration)
- Improve health and understand key principles to manage physical, mental, and social well-being throughout life.

PROGRAM

- Racket sports : learning and improving badminton skills
- Artistic activities : discovery and hands-on experience in Acrosport
- Team sports : training and coaching in Volleyball, Beach Volleyball, or Basketball
- Water sports : initiation and improvement in Kayaking
- Physical conditioning activities : introduction to general physical preparation and weight training
- Outdoor sports : initiation and improvement in Orienteering (CO) or climbing

BIBLIOGRAPHY

N/A

REQUIREMENTS

No prerequisites

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC2
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 0
Total : 18

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : HRM

SCOPE OF THE COURSE

OBJECTIVES

- Understand the theoretical foundations of Human Resource Management
- Know how to develop different HR policies based on the company
- Know how to implement Human Resource Management practices
- Understand and implement HR and managerial strategies

COMPETENCE AND SKILLS

- Gain a comprehensive and broad vision of major HR activities
- Be capable of performing operational HR roles
- Have the ability to transition between different HR roles

PROGRAM

- Introduction to HRM
- HRM and organizational contingencies
- HRM and organizational transformation
- Recruitment
- Training and skills development
- Performance evaluation
- Social dialogue
- Compensation

BIBLIOGRAPHY

- Peretti, J. M. (2020). *Gestion des ressources humaines*. Vuibert.
- Laroche, P., Guery, L., Moulin, Y., Salesina, M., & Stévenot, A. (2019). *GRH : Théories et nouvelles pratiques de la fonction RH*. De Boeck Supérieur.
- Igalens, J. (2006). *La GRH : principes, pratiques et critiques*. In *Management et gestion des ressources humaines : stratégies, acteurs et pratiques*, 25.

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC3
ECTS : 1.5

DURATION

Lectures : 4
Tutorial classes : 12
Labs : 0
Total : 16

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Leadership and Management

SCOPE OF THE COURSE

OBJECTIVES

- Acquire knowledge to better understand the complexity of our environment through leadership and management adapted to the sector's and profession's specificities. How to organize collective action despite turbulence? How to manage skills development, including in regulated professions? How to meet professionals' ambitions, ease tensions, and communicate effectively.

COMPETENCE AND SKILLS

Adopt a leadership and management posture with collaborators in a professional context, Develop constructive, motivating, and mobilizing communication through an understanding of different management styles and personalities, Encourage autonomy and initiative among team members, thereby becoming a true reference point for organizational, functional, and strategic aspects.

PROGRAM

- Differentiate between management and leadership, manage interpersonal and group dynamics.
- The importance of relational intelligence and assertive communication.
- Ability to conceptualize the transformation of a complex environment.
- Develop your leadership in a context of uncertainty and continuous transformation.
- Managing complex operations and crises.

BIBLIOGRAPHY

Mintzberg, H. (2004). Leadership and management development : An afterword. Academy of Management Perspectives, 18(3), 140-142. Jean-Michel Plane (2026), Théories du leadership - 2nd edition : Classical and contemporary models.

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC4
ECTS : 2

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 8
Total : 26

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Reactors and Bioreactors

SCOPE OF THE COURSE

OBJECTIVES

This course aims to train students in the design, sizing, modeling, and operation of chemical and biological reactors, with a particular focus on agri-industrial processes. It ensures an integrated understanding of phenomena at different scales, from the microscopic scale (chemical kinetics, enzymatic kinetics, microbial growth) to their implementation at the industrial scale (reactors, bioreactors, fermentation processes). The course integrates biological constraints (microorganisms, enzymes, cellular needs), physicochemical constraints (mass and heat transfers, hydrodynamics), and industrial constraints (productivity, energy consumption, scale-up). Special attention is given to industrial fermentations (alcoholic, lactic, acetic, citric, etc.) and the operating conditions influencing their performance (temperature, pH, aeration, agitation).

COMPETENCE AND SKILLS

Upon completion of this course, the student will be able to establish material and energy balances for chemical and biological reaction systems, analyze the kinetics of processes including microbial growth (growth phases, Monod law), enzymatic kinetics (Michaelis-Menten model), and chemical reaction kinetics, and model substrate consumption as well as product and biomass formation. The student will also know how to identify and select an appropriate type of reactor (batch, fed-batch, continuous, CSTR, Plug flow), size a reactor (volume, residence time, conversion), and analyze bioreactor performance in terms of yield (biomass, substrate, energy), productivity, and oxygen transfer (kLa). The student will be able to study transfer phenomena (gas-liquid, liquid-solid mass transfer, heat transfer), understand reactor hydrodynamics (agitation, mixing, residence time), simulate and optimize a process, and scale up a process from laboratory to industrial scale.

PROGRAM

The program covers the essential foundations of process engineering by integrating chemical kinetics, applied thermodynamics, and basic microbiology, while considering cellular needs in nutrients, oxygen, and energy. It then addresses fermentations and bioprocesses through the definition of industrial fermentations (alcoholic, lactic, acetic, citric), the different types of processes, and the culture of microorganisms in fermenters (bioreactors), including the use of biosensors for monitoring and controlling biological systems. The course also develops the kinetics of biological processes, including microbial growth (growth phases), the Monod model, and enzymatic kinetics with fundamental concepts and the Michaelis-Menten model. The different types of reactors and bioreactors (batch, fed-batch, continuous, CSTR, Plug flow) are studied in relation to operating parameters such as temperature, pH, aeration, and agitation. The program also includes the study of transfer phenomena and hydrodynamics (oxygen transfer kLa, mixing, agitation, residence time), as well as material and energy balances and biomass yields. It further addresses process modeling and simulation through balance equations, followed by design principles (reactor sizing, energy consumption, heat and mass transfers, multi-scale study from microscopic to macroscopic). Finally, it covers scale-up for industrial applications in the agri-food sector.

BIBLIOGRAPHY

Doran, P.M. (2012). Bioprocess Engineering Principles. Academic Press. Froment, G.F., Bischoff, K.B. & De Wilde, J. (2010). Chemical Reactor Analysis and Design. Wiley. Levenspiel, O. (1999). Chemical Reaction Engineering (3rd ed.). John Wiley & Sons. Nauman, E.B. (2008). Chemical Reactor Design, Optimization, and Scaleup. Wiley-AIChE. Villadsen, J., Nielsen, J. & Lidén, G. (2011). Bioreaction Engineering Principles. Springer. Villermaux, J. (1993). Chemical Reaction Engineering. Technique et Documentation

REQUIREMENTS

- Complementary Physics (Thermodynamics and Fluid Mechanics).
- Transfer Phenomena : Basic concepts of mass and heat transfer.
- Biochemistry, General Microbiology and Food Microbiology (Metabolism, Bacterial Growth, Enzyme Structures).
- Mathematics : Simple differential equations and integral calculus

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC5
ECTS : 2

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 8
Total : 26

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Automation and Maintenance

SCOPE OF THE COURSE

OBJECTIVES

For the Automation part : - Provide students with the fundamentals for implementing sequential control graphs for elementary systems

For the Maintenance part : - Discover different automation manufacturers for the agrofood industry - Understand the architecture of an electrical panel - Understand the input and output parts of an automation system

COMPETENCE AND SKILLS

For the Automation part : This course aims to enable the future agrofood engineer to - Design sequential control graphs for elementary systems using the GRAFCET formalism. - Understand specifications described by GRAFCETs for more complex systems

For the Maintenance part :

PROGRAM

For the Automation part, the proposed program is as follows : - Study of the standardized GRAFCET formalism and its hierarchical structure : - Basic elements and structures of GRAFCET - Structural and behavioral enhancements. - Developing a GRAFCET model based on specifications.

For the Maintenance part : - Analyze different industrial automation manufacturers in the agrofood industry, highlighting the strengths and weaknesses of each. - Analyze a photo of an electrical cabinet and identify the various components. - Know the different types of sensors and actuators in a machine.

BIBLIOGRAPHY

R DAVID and H. ALLA, From GRAFCET to Petri Nets, HERMES, 1989

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC6
ECTS : 1

DURATION

Lectures : 6
Tutorial classes : 4
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Industrial Performance

SCOPE OF THE COURSE

OBJECTIVES

Deepening the analysis and monitoring of industrial performance; Understanding, measuring, and improving the overall performance of a production system. Diagnosing, analyzing, critiquing, and proposing improvement actions at the scale of a process, line, workshop, or production organization. Consolidating their understanding of the interactions between production, quality, maintenance, and industrial organization; Mastering measurement and monitoring tools for industrial performance; analyzing gaps between expected and observed performance; identifying sources of losses, deviations, and dysfunctions; Proposing improvement levers adapted to the constraints of agri-food industries; Embedding performance improvement within a framework of operational excellence and continuous improvement.

COMPETENCE AND SKILLS

Define and characterize industrial performance using technical, economic, organizational, and qualitative indicators; Build, operate, and comment on a performance dashboard for monitoring; Calculate and interpret the main performance indicators of a production system; Analyze performance losses in a line, workshop, or process; Identify explanatory factors for a performance gap based on industrial data; Conduct a structured diagnosis combining production, quality, maintenance, and organization; Prioritize action levers based on their technical, economic, and organizational impact; Propose a realistic, well-argued, and context-adapted improvement plan for the agri-food sector; Use problem-solving and continuous improvement tools; Present an industrial performance diagnosis and defend recommendations

PROGRAM

1. Industrial performance : concepts, stakes, and positioning
2. Measuring and monitoring performance
3. Analyzing losses and diagnosing dysfunctions
4. Performance and process control
5. Performance, quality, and associated costs
6. Performance and equipment maintenance
7. Energy performance, materials, and sustainability
8. Continuous improvement and operational excellence
9. Applications and case studies in the agri-food industry

BIBLIOGRAPHY

Froment, G.F., Bischoff, K.B., and De Wilde, J. (2010). *Chemical Reactor Analysis and Design*. Wiley.

REQUIREMENTS

— Transport phenomena : Basic concepts of mass and heat transfer.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC7
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 0
Labs : 0
Total : 4

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE8-PROD

SAÉ Prod

SCOPE OF THE CHALLENGE

WORKING SITUATION

COMPETENCES AND LEVEL ASSESSED

EXPECTED OUTPUTS

RESOURCES

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC8
ECTS : 3

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 0
Total : 0

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Supervised Project + Skills Assessment
(English/Internship)

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

Levenspiel, O. (1999). *Chemical Reaction Engineering* (3rd ed.). John Wiley and Sons.

REQUIREMENTS

— Biochemistry, General Microbiology and Food Microbiology (Metabolism, Bacterial Growth, Enzymatic Structures).

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE1-EC9
ECTS : 0

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 0
Total : 0

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-PROD

COURSE : Individual follow-up / Portfolio

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE3-EC1
ECTS : 2

DURATION

Lectures : 3
Tutorial classes : 3
Labs : 12
Total : 18

Project :
Personnal work :

ASSESSMENT

Continuous assessment; Individual knowledge evaluation; Oral presentation of a group work

TEACHING MATERIALS

Provision of methodological supports and document templates based on ISO 19011

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-QHSE

COURSE : PRP and HACCP Audit

SCOPE OF THE COURSE

OBJECTIVES

This module aims to train engineering students in the operational conduct of an internal food safety audit, from preparation to presentation, based on the guidelines of ISO 19011 and the main regulatory and normative requirements applicable to agri-food companies.

COMPETENCE AND SKILLS

Upon completion of the training, the engineering student must be able to : - Understand the role of internal audits in controlling food safety; - Prepare an audit based on a reference framework, a defined scope, and objectives; - Develop an audit plan and an interview grid based on applicable requirements; - Conduct interviews, observe work situations, and collect objective evidence; - Formulate factual, prioritized, and actionable audit findings; - Write a structured audit report; - Present audit conclusions orally to an audited organization; - Adopt a professional auditor's posture : impartiality, listening, rigor, confidentiality, analytical skills.

PROGRAM

Part 1 : - Fundamentals of food safety audits - Audit principles according to ISO 19011 - General audit process - Auditor's posture Part 2 : - Methodological preparation of the audit - Defining the audit scope - Developing the audit plan - Building the interview guide Part 3 : - On-site audit in an agri-food company - Conducting an opening meeting - Visit, interviews, observations, and evidence collection - Synthesis and conducting a closing meeting Part 4 : - Writing the report - Formulating findings - Oral presentation and feedback

BIBLIOGRAPHY

- ISO 19011 — Guidelines for auditing management systems
- ISO 22000 :2018 — Food safety management systems
- ISO/TS 22002-1 — Prerequisite programmes for food manufacturing.

REQUIREMENTS

- Knowledge of standards and regulations applicable to the agri-food sector
- In-depth mastery of hygiene best practices and the HACCP method
- Understanding of management systems and quality principles
- PDCA logic and problem-solving methods

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC1
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 4
Labs : 10
Total : 14

Project :
Personnal work :

ASSESSMENT

deliverables and presentations

TEACHING MATERIALS

Mission support, data, guides, reports...

LANGUAGE

English

CONTACT

Khalid ADDI

Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : Innovation competition

SCOPE OF THE COURSE

OBJECTIVES

This course aims to develop students' ability to successfully complete, in groups (7 to 12 students), an innovation project involving problem-solving, continuous improvement, or the design of new breakthrough solutions, while considering sustainability challenges.

COMPETENCE AND SKILLS

mobilizing and combining tools related to innovation methodology acquired in the resources, learning to learn (completing tools...), working in a project group (shared reflexivity, autonomy, time and stress management...), communicating and convincing

PROGRAM

Downstream innovation : Prototyping, feasibility, launch

BIBLIOGRAPHY

Nauman, E.B. (2008). Chemical Reactor Design, Optimization, and Scaleup. Wiley-AIChE.

REQUIREMENTS

— Mathematics : Simple differential equations and integral calculus.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC2
ECTS : 2

DURATION

Lectures : 0
Tutorial classes : 20
Labs : 10
Total : 30

Project :
Personnal work :

ASSESSMENT

Internal assessment Situational assessments on professional skills Minimum of 2 assessments per semester External assessment : TOEIC (Semesters 8–9)

TEACHING MATERIALS

General English : Current affairs topics, press, internet Specialized English : Technical and scientific resources Professional English : CV, cover letter, email TOEIC past papers

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : English

SCOPE OF THE COURSE

OBJECTIVES

This course, taught in English, aims to develop pragmatic, sociocultural, and linguistic skills aligned with the CEFR across all four language activities, using varied teaching methods in interactive lectures (CM), tutorials (TD), and practical labs (TP). Activities include listening and reading comprehension, written productions (essays, summaries, memos, internship reports), and oral productions (presentations, group projects, improvisations, discussions, and debates). These prepare students for professional English use while fostering critical thinking.

COMPETENCE AND SKILLS

- Understand spoken and written English
- Express oneself in writing and speaking (continuous and interactive production)
- Use technical, scientific, and professional documents
- Prepare for the TOEIC : Level 4 (B2.2)

PROGRAM

- Understanding written and spoken documents
- Writing a summary based on a series of oral and written documents
- Interaction, discussion, defending a point of view, debate
- Advanced grammar and syntax correction, level 1 linking words, argumentative structures
- English rhythm and prosody
- Level 1 formal register

BIBLIOGRAPHY

REQUIREMENTS

- Can understand the essential content of complex subjects, including technical discussions in one's field.
- Can communicate with a degree of spontaneity and fluency such that conversation with a native speaker involves no tension for either party.
- Can express oneself clearly and in detail on a wide range of subjects, give an opinion on a current topic, and present the advantages and disadvantages of different possibilities.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC3
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 10
Labs : 0
Total : 10

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : English or second foreign language (LV2)

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

Villadsen, J., Nielsen, J. and Lidén, G. (2011). *Bioreaction Engineering Principles*. Springer.

REQUIREMENTS

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC4
ECTS : 2

DURATION

Lectures : 7
Tutorial classes : 21
Labs : 0
Total : 28

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : Cost Accounting and Financial Diagnosis

SCOPE OF THE COURSE

OBJECTIVES

- Understand the essential principles of cost accounting
- Know how to process general accounting data to determine results by product, customer, or site
- Know how to monitor and manage various budgets

COMPETENCE AND SKILLS

- Ability to consider the economic stakes of the agri-food company
- Ability to communicate with accounting specialists
- Ability to calculate costs and profitability of a production process

PROGRAM

Collecting accounting information Stock valuation (FIFO, weighted average cost method) Full costing, activity-based costing method Rational allocation of fixed costs Break-even point Budgeting techniques

BIBLIOGRAPHY

- Dubrulle L. and Jourdain D., *Comptabilité analytique de gestion*, Dunod
- Gervais M., *Contrôle de gestion*, Economica

REQUIREMENTS

General Accounting

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC5
ECTS : 2

DURATION

Lectures : 4
Tutorial classes : 14
Labs : 8
Total : 26

Project :
Personnal work :

ASSESSMENT

1 written exam, 2 oral presentations, 1 project report, 1 lab report; - Final grade = 1/2 CC1 + 1/2 CC2

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : Food biotechnology

SCOPE OF THE COURSE

OBJECTIVES

This module enables students to acquire fundamental technical and transversal skills to address multidisciplinary issues related to living organisms, their understanding, and their application in the agri-food sector.

COMPETENCE AND SKILLS

- Mastering different culture modes in bioreactors
- Knowing how to control culture parameters
- Knowing how to optimize biomass, enzyme, or metabolite production
- Understanding the main food applications of green biotechnology
- Understanding metabolic engineering methods applied in particular to enzyme and food ingredient production
- Understanding risk assessment associated with market authorization applications (GMOs, enzymes, technological aids)

PROGRAM

1- Biotechnology : Microorganisms used in biotechnology; Production of ferments and biomass; Enzyme production; Production of ingredients and additives; Construction and characterization of microbial GMOs; GMO assessment and authorizations 2- Case study in PBL (Problem-Based Learning) : Production of an enzyme via microbial route using a genetically modified microorganism 3- Lab work : Implementation, control, and performance comparison of bioreactors (batch and fed-batch; free and immobilized cells)

BIBLIOGRAPHY

REQUIREMENTS

Basic knowledge in microbiology and molecular biology, SDA, Toxicology, Unit operations, Processes and preservation, Additional physics, System regulation, Process engineering, Reactors and bioreactors, Automation

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC6
ECTS : 2.5

DURATION

Lectures : 4
Tutorial classes : 15
Labs : 10
Total : 29

Project :
Personnal work :

ASSESSMENT

Continuous assessments, oral presentation, 1 lab report; - Number of assessments : 3; 2 hours; Final grade = 1/2 CA + 1/4 oral + 1/4 lab work

TEACHING MATERIALS

LANGUAGE

English

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Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : Applied enzymology

SCOPE OF THE COURSE

OBJECTIVES

This module aims to provide theoretical and experimental knowledge of enzymatic catalysis and kinetics in both fundamental and applied contexts within the agrofood industry.

COMPETENCE AND SKILLS

- Ability to optimize enzyme production
- Ability to purify an enzyme, characterize it, and assess the success of the purification process
- Knowledge of the main agrofood applications of enzymatic preparations
- Understanding of risk assessment associated with applications for market authorization of enzymes
- Knowledge of enzymatic reactors

PROGRAM

1- Main enzymes of interest in the agrofood industry and their applications 2- Production of enzymes via recombinant pathways 3- Enzymatic preparations and purified enzymes 4- Implementation of enzymatic preparations 5- Enzymatic reactors with free and immobilized enzymes 6- Case study in APP and lab work : Purification and characterization of an enzyme expressed via microbial pathway using a genetically modified microorganism

BIBLIOGRAPHY

REQUIREMENTS

Basic knowledge in biochemistry, general enzymology, microbiology, molecular biology, DNA, toxicology, unit operations, processes and preservation, additional physics, system regulation, process engineering, reactors and bioreactors, automation, food biotechnology.

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC7
ECTS : 1

DURATION

Lectures : 0
Tutorial classes : 8
Labs : 0
Total : 8

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

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UE : UE8-R

COURSE : Research seminar

SCOPE OF THE COURSE

OBJECTIVES

This module aims to raise students' awareness of the Research & Development (R&D) approach and academic research. It seeks to explore current technological and scientific challenges related to the valorization of tropical agro-resources in an island environment. Students will be led to decipher the interaction between processing methods, preservation of nutritional qualities, and specific geographical constraints.

COMPETENCE AND SKILLS

Upon completion of this module, the student will be able to : - Synthesize a current research problem based on an expert intervention or a scientific article reading. - Identify technological bottlenecks related to the processing of tropical products (fruits, starchy foods, spices, seafood). - Argue the challenges of food self-sufficiency and the valorization of co-products in an island environment. - Develop a critical mindset regarding technical innovations and scientific publications.

PROGRAM

The program is structured around cycles of conferences and supervised analysis sessions. - Scientific monitoring and reading methodology (how to read, analyze, and critique a scientific article; scientific databases; introduction to specific issues : tropical biodiversity and food resilience in islands, etc.). - Thematic conferences (e.g., valorization of tropical agroresources; Nutrition and Health in tropical island environments). - Debates and exchanges : analysis of a research problem encountered during previous sessions; debate on the role of the food engineer in technology transfer between laboratory and industry, etc.

BIBLIOGRAPHY

Scientific productions/Research projects conducted by local research actors (UMR QualiSud, CIRAD, UR). Articles from international journals : Journal of Food Engineering, Food Chemistry, or specialized journals on tropical products. Institutional reports : Reports from CIRAD, IRD, and ANSES on overseas contexts.

REQUIREMENTS

Knowledge in sciences and technologies, food processes.

Fluency in technical English (for reading article abstracts).

General knowledge of local agri-food sectors (fruits, vegetables, sugarcane, fishing).

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC8
ECTS : 2.5

DURATION

Lectures : 7
Tutorial classes : 17
Labs : 8
Total : 32

Project :
Personnal work :

ASSESSMENT

Continuous assessment Individual knowledge evaluation Oral presentation of group work

TEACHING MATERIALS

Course and tutorial materials provided

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE8-R

COURSE : Nutrition and Health

SCOPE OF THE COURSE

OBJECTIVES

Understand and improve knowledge of the links between diet, nutrition, and human health.

COMPETENCE AND SKILLS

Generate an innovative product idea, analyze its environment, and identify a market opportunity Develop a functional specification Design and implement a complex experimental plan Analyze technical and financial feasibility Research resources, synthesize, and present the work in English using appropriate statistical tools

PROGRAM

- Organization of the digestive system, fate of food from ingestion to assimilation.
- Molecular bases and modeling of human digestion : description of digestion, absorption, and metabolism phenomena involved for each nutrient group
- Benefits of prebiotics and probiotics.
- Factors influencing bioavailability, nutritional value of a food. Implications for physiological functions and the concept of nutritional strategy.
- Dynamic mechanisms of postprandial regulation, glycemia, and lipemia.
- Understanding pathologies and health deterioration linked to diet such as type 2 diabetes, obesity, hypercholesterolemia, allergies and food intolerances, sarcopenia.

BIBLIOGRAPHY

REQUIREMENTS

Nutrient needs and intake

IDENTIFICATION

Course code : ESI-SPI-CI-AG4-S8-UE2-EC9
ECTS : 1

DURATION

Lectures : 4
Tutorial classes : 0
Labs : 0
Total : 4

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE8-R

SAE RD

SCOPE OF THE CHALLENGE

WORKING SITUATION

COMPETENCES AND LEVEL ASSESSED

EXPECTED OUTPUTS

RESOURCES

IDENTIFICATION

Course code : E5AG9A11
ECTS : 3

DURATION

Lectures : 14
Tutorial classes : 12
Labs : 10
Total : 36

Project :
Personnal work :

ASSESSMENT

- Individual assessment - Oral presentation and group deliverable

TEACHING MATERIALS

See tutor guide and student guide, IDEONIS and HILL developed tools

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE

COURSE : Juice of the future

SCOPE OF THE COURSE

OBJECTIVES

Project 2 is dedicated to new product development in the non-alcoholic beverage industry. The context relates to innovation in the fruit juice category within an intertropical setting, considering local raw materials for product formulation and aiming for a low environmental impact for the manufactured product. This project will be carried out in student groups.

COMPETENCE AND SKILLS

- Be able to design a new product or improve an existing one, particularly in the intertropical context;
- Take into account the environmental aspect of a project;
- Evaluate and implement the appropriate technologies with regard to the available food matrices;
- Know how to perform a functional analysis of a food product and be able to select the appropriate combination of ingredients/additives/processes to meet the requirements.

PROGRAM

Over the courses, students will have to : - Analyze the state of the art and the market; - Pursue an innovative process; - Design a new product or improve an existing one using a local resource; - Assess and optimize the environmental impact of product formulation; - Evaluate and implement the appropriate technologies with regard to the available food matrices; - Perform a functional analysis of a food product and be able to select the appropriate combination of ingredients/additives/processes to meet the requirements; - Design sensory analysis.

Throughout the project, students will benefit from tutoring and courses on : - Juice processing; - Innovation process and creativity; - Marketing studies; - Sensory analysis. The students will also benefit from practical work in agro-food technology and sensory analysis labs.

BIBLIOGRAPHY

REQUIREMENTS

Knowledge of food formulation; Food processing operations / Food processing engineering; Sensory analysis; Notions of marketing.

IDENTIFICATION

Course code : E5AG9A12
ECTS : 3

DURATION

Lectures : 14
Tutorial classes : 12
Labs : 10
Total : 36

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

See tutor guide and student guide, IDEO-NIS and HILL developed tools

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE

COURSE : Supply chain management for dairy products

SCOPE OF THE COURSE

OBJECTIVES

Project 3 is an application dedicated to supply chain management for sensitive dairy products. A focus will be made, on the one hand, on the insularity context by considering low accessibility issues, customs limitations, and European standards; and, on the other hand, on food security constraints such as food defense and cold chain maintenance. This project will be performed in groups of students.

COMPETENCE AND SKILLS

PROGRAM

Over the courses, students will have to : - Analyze the state of the art ; - Consider the regulatory and international context ; - Propose flux analysis of the activity ; - Plan and test different schedules with mathematical tools ; - Determine lead time and plan delivery dates ; - Manage inventory.

All along the project, students will benefit from tutoring and courses on : - Contextualization of the dairy product sector in the intertropical zone ; - Logistics system and supply chain ; - Lean management tools.

BIBLIOGRAPHY

REQUIREMENTS

Basic knowledge of logistics systems and supply chain management ; Basic knowledge of corporate social responsibility.

IDENTIFICATION

Course code : E5AG9A21
ECTS : 4

DURATION

Lectures : 14
Tutorial classes : 12
Labs : 10
Total : 36

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

See tutor guide and student guide, IDEONIS and HILL developed tools

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE

COURSE : Innovative products based on local starchy roots

SCOPE OF THE COURSE

OBJECTIVES

Project 4 is dedicated to the transformation and processing of local raw materials rich in starch and other agro/bio-molecules. Processing technologies such as extraction, separation techniques and drying processes will be focused on. Formulation of intermediate and/or end products will be carried out. This project will be performed in groups of students.

COMPETENCE AND SKILLS

PROGRAM

Over the courses, students will have to : - Analyze the state of the art ; - Plan experiments with suitable mathematical tools ; - Implement and realize experiments and analyze data with the use of fundamental sciences. - Develop new food products using local starchy resources ; - Propose ways to increase the added value of raw materials and the use of by-products ; - Research for appropriate transformation equipment ; - Assess the feasibility and the suitability of the product or of the global process.

All along the project, students will benefit from tutoring and courses on : - Inter-tropical starchy roots ; - Agri-food processing with special focus on extraction-separation and drying technologies ; - Experimental design using mathematical tools ; - Food formulation and analytical characterization.

Students will benefit from practical work in agro-food technology, culinary and physical-chemistry labs.

BIBLIOGRAPHY

REQUIREMENTS

Knowledge in food process engineering/technologies and unitary operations, notions of experimental planning (experimental design) and statistics, analytical characterization, eco-conception methodologies.

IDENTIFICATION

Course code : E5AG9A22
ECTS : 4

DURATION

Lectures : 20
Tutorial classes : 18
Labs : 14
Total : 52

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

Modifié le : 14 juillet 2026

UE : UE

COURSE : Underutilized vegetables for nutritional security

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : E5AG9A31
ECTS : 5

DURATION

Lectures : 20
Tutorial classes : 18
Labs : 14
Total : 52

Project :
Personnal work :

ASSESSMENT

- Individual assessment - Oral presentation and/or group deliverables

TEACHING MATERIALS

See tutor guide and student guide, IDEONIS and HILL developed tools

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE

COURSE : Improving ultra-processed foods

SCOPE OF THE COURSE

OBJECTIVES

Project 6 is dedicated to assessing, performing, and improving ultra-processed foods. The aspects of formulation in relation to health and environmental consequences, as well as processes, will be considered.

COMPETENCE AND SKILLS

- Know how to perform a functional analysis of a food product and select ingredients/additives/processes in response;
- Be able to use environmental impact assessment tools in the development of a product/process to control or reduce them to an acceptable level;
- Be able to size a new agro-food processing unit/line extension/industrial plant, or improve an existing one while integrating technical constraints and regulatory aspects;
- Know how to qualify and assess the degree of product/process innovation.

PROGRAM

Over the courses, students will have to perform : - Analyze the state of the art from both general and specific perspectives of the subject; - Reformulate food products/modify manufacturing diagrams considering health and environmental aspects; - Evaluate possible alternatives for resizing an existing production line (equipment, staff, flow); - Assess the feasibility of the project from technical and financial perspectives.

For this project, students will attend courses/conferences on : - Ultra-processed products and ingredients; - Eco-design and environmental impact of food products; - Visits to production sites; - Sizing of production units.

Students will benefit from practical work in the agro-food technology, culinary, and physical-chemistry labs.

BIBLIOGRAPHY

REQUIREMENTS

Knowledge of food formulation, nutrition, food process engineering/technologies and unit operations, experimental design, analytical and sensory characterization, eco-design methodologies, project management, and statistics.

IDENTIFICATION

Course code : E5AG9PI1
ECTS : 1

DURATION

Lectures : 8
Tutorial classes : 6
Labs : 4
Total : 18

Project :
Personnal work :

ASSESSMENT

- Individual assessment - Oral presentation and group deliverable

TEACHING MATERIALS

See tutor guide and student guide, IDEONIS and HILL developed tools

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE

COURSE : Eco-responsible sector development strategy for identity products

SCOPE OF THE COURSE

OBJECTIVES

This first subject is an application dedicated to immersing students in a project management situation. It will focus on the strategic analysis of a Reunionese identity sector related to roasted food products such as cocoa, and on identifying the key factors affecting its activity. This project will be carried out in student groups.

COMPETENCE AND SKILLS

- To master technical resources and tools related to project management ;
- To be able to communicate and present a project in English ;
- To know how to conduct a strategic analysis ;
- To be able to formalize project objectives by processing and classifying all available information ;
- To be able to analyze a problem (scientific and technical) and frame it appropriately ;
- Capacity for organization, management, and integration into a team.

PROGRAM

Over the courses, students will have to : - Analyze the state of the art ; - Plan the project organization ; - Identify and interact with all the actors of the targeted sector ; - Assess internal and external factors affecting the sector either positively or negatively ; - Identify the most suitable approaches to meet the needs of a developing identity sector in an insular and intertropical context using an eco-responsible approach ; - Propose a development plan.

All along the project, students will benefit from tutoring and courses on : - Project organization, PDCA, individual tasks and deliverables ; - Visits to production and/or processing sites ; - Roasted/high added-value food products ; - Creation and presentation of the state of the art.

BIBLIOGRAPHY

REQUIREMENTS

Basic knowledge or introduction to project management ; bibliographic research ; understanding of food processing sectors.

IDENTIFICATION

Course code : E5AG9PI2
ECTS : 3

DURATION

Lectures : 14
Tutorial classes : 12
Labs : 10
Total : 36

Project :
Personnal work :

ASSESSMENT

Individual assessment; group report and examination

TEACHING MATERIALS

See tutor guide and student guide, IDEONIS and HILL developed tools

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : UE

COURSE : Food safety in a meat transformation unit

SCOPE OF THE COURSE

OBJECTIVES

Each project aims to develop new food products or to adapt processes to ensure food security and nutritional security in an intertropical or insular environment. A special focus will be placed on the use of local resources, supply chain management constraints (including market and distribution), food quality in terms of safety, nutrition and sensory aspects, lifecycle including food packaging, environmental sustainability of the activity, regulations and cultural context. Project 1 is dedicated to safety analysis in transformation units relative to the meat-products sector. A focus will be made on the different steps of transformation in a poultry production system. This project will be performed in groups of students.

COMPETENCE AND SKILLS

- To be able to analyze a problem (scientific and technical) and to pose it well;
- To know how to bring a process into compliance with regulations and how to react in the event of a safety crisis;
- To be able to determine the shelf life of a food product.

PROGRAM

Over the courses, students will have to : - Analyze the state of the art and consider regulation conformity; - Identify the critical steps or operations for the meat industry, especially stabilization technologies and hygiene practices with risk analysis tools; - Address the food-safety problems faced by tropical meat product industries; - Propose problem-solving methodologies to avoid safety issues in transformation units; - Plan and conduct experiments.

Throughout the project, students will benefit from tutoring, courses, or visits on : - Meat-products industry; - Food quality management in a sensitive environment and hazard analysis; - Global consideration of infectious risk (One Health concept); - Experimental design; - Practical work in the microbiology lab.

BIBLIOGRAPHY

REQUIREMENTS

Knowledge in food process engineering/technologies and unitary operations; experimental planning (experimental design); microbiology; food safety.

IDENTIFICATION

Course code : E5AG9PL1
ECTS : 6

DURATION

Lectures : 20
Tutorial classes : 18
Labs : 14
Total : 52

Project :
Personnal work :

ASSESSMENT

- Individual assessment - Oral presentation and/or group deliverables

TEACHING MATERIALS

See tutor guide and student guide, IDEONIS and HILL developed tools

LANGUAGE

English

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Modifié le : 14 juillet 2026

UE : UE

COURSE : Marine resources in an intertropical and insular context

SCOPE OF THE COURSE

OBJECTIVES

Project 7 is dedicated to marine food products and the exploitation of aquaculture resources in an insular context. It aims to develop new food products from local resources to ensure food security and nutritional security.

COMPETENCE AND SKILLS

- Be able to perform a functional analysis for innovative product development and eco-design ;
- Have a global view of economic and industrial issues and opportunities ;
- Be able to leverage tropical resources ;
- Be able to use assessment tools for environmental impacts / nutritional quality / sensory profile in the development of a product or process, to control them or bring them to an acceptable level ;
- Know how to carry out interdisciplinary projects and communicate their work effectively.

PROGRAM

Students will have to perform an analysis of the state of the art and a strategic analysis of the marine food sector, and use the competencies acquired in previous projects, to develop an innovative product while considering supply chain management constraints, food quality in terms of safety, nutrition and sensory aspects, the life cycle including food packaging, the environmental sustainability of the activity, regulations, and cultural context.

Students will benefit from tutoring and courses related to the theme, as well as site visits and access to agro-food technology labs, culinary labs, sensory analysis labs, and physico-chemistry labs for practical work.

BIBLIOGRAPHY

REQUIREMENTS

Knowledge in innovation and eco-design ; Formulation ; Food process engineering/technologies ; Nutrition ; Sensory evaluation ; Food analysis and microbiological safety ; Supply chain management ; Business model.

IDENTIFICATION

Course code : E5E10SAN
ECTS : 10

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 0
Total : 0

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : Stages

COURSE : English-speaking internship

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS

IDENTIFICATION

Course code : E5E10SFE
ECTS : 20

DURATION

Lectures : 0
Tutorial classes : 0
Labs : 0
Total : 0

Project :
Personnal work :

ASSESSMENT

TEACHING MATERIALS

LANGUAGE

English

CONTACT

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Modifié le : 14 juillet 2026

UE : Stages

COURSE : Final Year Internship

SCOPE OF THE COURSE

OBJECTIVES

COMPETENCE AND SKILLS

PROGRAM

BIBLIOGRAPHY

REQUIREMENTS