MASTER OF SCIENCE AND ENGINEERING AT ISA LILLE

COURSE GUIDE

2018-2019

ENGLISH TAUGHT COURSES

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MAJOR IN AGRICULTURAL SCIENCE

Master of Science and Engineering Program

ISA Lille's Agricultural Science program aims to give students:

› an international view of the issue of agriculture, highlighting certain national and/or regional specificities,

› the necessary tools to manage crop and livestock production, as well as agricultural processes, from ruminant nutrition to distribution channels

› a practical view of site management, thanks to lectures and seminars by experts in the field;

› the methods to manage projects within an international context, with multicultural staff.

Contact

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English-Taught Courses

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WELCOME SESSION

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
COORDINATOR: HÉLÈNE LERUSTE

1-Objectives and Skills developed

This welcome session is a mandatory course for any student from another university joining the first semester of Master 1 at ISA Lille (degree seeking or exchange students). It is an introductory course to the teaching at ISA Lille (scientific skills, communication skills, knowledge on agriculture and food chain). The objectives of the welcome session are to:

› Get used to the pedagogic methods, expectations and type of evaluations at ISA

› Introduce the lectures from the 4th year in agriculture and food chains

› Give reminders on scientific writing and communication methods

› Get to know each other and prepare to meet future colleagues from 4th year.

2-Content and Organization

Lectures – Workshops – Group work

SCIENTIFIC COMMUNICATION (33% of the credits)

› Prepare for future scientific work through a written and oral assignment on scientific topics

› 8h lectures on the methodology for a literature review/ 22h of work in small groups

› Evaluation: Individual literature review + Group oral presentation of a press review

FOOD CHAIN (33% of the credits)

› How are the food chain organized in the European context?

› 17h of lectures on food chain organizations / analysis of some specific food chains

› Evaluation: Individual exam

INTERCULTURAL COMMUNICATION and INTERPERSONAL SKILLS (17% of the credits)

› Get a glimpse at how cultural differences interact in our relationship and communication with others, and how communication between people works…

› 15h + 12h of workshop + 12

› Evaluation: exercises during the workshops + short individual report + participation in the workshops

NOTE: Non French speaking students will also take 15h of French as Foreign Language course

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PROJECT IN AGRICULTURE

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: FR OR EN
ECTS: 6
TEACHER/COORDINATOR: ERIC TAISNE

1-Main objectives

› Study a project in the farming sector, in response to the request of a partner (farmer or professional working in connection with farms)

› Meet the expectations of the partner, with a solution in relation to the demand.

2-Skills developed

› Understand and analyze the problem.

› Define objectives.

› Manage a project (project schedule, anticipation of risks, evaluation of resources, distribution of tasks, taking into account the constraints)

› Develop relationships (in the group, with the partners, with the teacher)

3-General content

› Eleven days dedicated to the study, including one whole week.

› Projects presentation, choice of the groups and the project assignments

4- Evaluation

› Intermediate evaluation after 3-4 work weeks

› Final oral evaluation in the presence of the partner, written report

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RUMINANT NUTRITION AND ROUGHAGE SYSTEMS

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JOOP LENSINK / VALÉRIE JACQUERIE

1-Main objectives

› Train future animal nutrition managers (formulation, R & D, sales) and breeding advisors

› Enhance knowledge on ruminant feed and roughage systemsworking in connection with farms)

2-Skills developed

› Identify problems related to feed-imbalanced diets (health, product quality, sustainability...)

› Develop a systematic and systemic approach regarding ruminant farms

3-General content

› Roughage (fodder) systems and grazing management

› Pasture management and plant variety use

› Ruminant (feed) systems and sustainability approach

› Metabolic diseases related to rumination

› International feed and animal diet evaluation systems

4- Evaluation

› Written individual exam

5- Program

› Introduction: Ruminant production systems

› Roughage and conservation methods

› Pasture and grass management / Productivity of grass / Different species in grasslands

› Roughage systems

› Ruminant-specific metabolic diseases

› Rationing and feed systems (in France and abroad): technical and economic analysis

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PLANT BIOTECHNOLOGIES

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: FR
ECTS: 6
TEACHER/COORDINATOR: PATRICE HALAMA

1-Main objectives

› Improve knowledge on techniques and applications of biotechnologies in crop production

› Investigate the presence of Septoria leaf blotch resistance genes on different varieties of wheat

2-Skills developed

› To have a general outlook on plant biotechnology principals and application

› Implementation of experiments integrating biotechnology techniques

› Management of a mini-project in plant biotechnology (research, bibliography, presentation)

3-General content

Lectures, practicals, visits

› Biotechnology application in micropropagation

› Biotechnology applications to regenerate plants virus-free and in plant breeding (Protoplaste production, Androgyny, embryos culture)

› Realizing a mini-project

4- Evaluation

Reports, oral defense in group

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PLANT BREEDING AND GENETICS

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: ALI SIAH

1-Main objectives

› Acquire a background in the area of plant breeding and plant genetic selection (actors, organization, challenges, progresses, etc.)

› Understand the strategies and techniques of quantitative genetics applied for plant improvement

› Tools of biotechnology applied for plant breeding such as marker assisted selection and genomic selection

2-Skills developed

› Analyze constraints, technical and economic challenges of genetic improvement of various plant species.

3-General content

Lessons/conferences, company visits

› Organization of plant breeding sector

› Methods of plant breeding

› Quantitative genetics applied for plant breeding

› Marker assisted selection and genomic selection

› Breeding specificities of different plant species

› Seed production and regulation

4- Evaluation

› Individual exam – Synthesis report and oral defense on a subject not developed during the courses.

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ANIMAL WELFARE: FROM CONSUMER DEMAND TO FARM AUDITING

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: VANESSA GUESDON - HÉLÈNE LERUSTE

1-Main objectives

› Define what is animal welfare and what influences people's perception of animal welfare

› Discuss major factors influencing animal welfare with a specific focus on housing, nutrition and management practices (inducing pain)

› Determine how to evaluate animal welfare on a farm level, set-up and perform a simple audit, and analyze the results

› Know how (European) legislation in animal welfare is constructed and what are the main aims of legislation

› Realize what is the market situation in terms of animal welfare-friendly products and the ways to increase the market

› Discuss future evolution in terms of legislation, situation for farmers and global markets

2-Skills developed

› Set-up (simple but valid) animal welfare scoring protocols

› Analyze results of a farm audit

› Capacity to anticipate future evolution

3-General content

› Welfare definitions

› Factors influencing animal welfare

› Legislation and future evolution

4- Evaluation

› Oral presentations in group, Final exam

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BIOCONTROL FOR SUSTAINABLE CROP PRODUCTION

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JÉRÔME MUCHEMBLED - ALI SIAH

1-Main objectives

› Understand the modes of action of biocontrol products.

› Integration of biocontrol products in cropping systems and agronomic advice.

› Know the organization and different actors of biocontrol area.

2-Skills developed

› Identify different categories of biocontrol and understand the sector

› Identify available biocontrol products for plant protection and crop production (arable crops and specialized crops)

› Understand how a biocontrol product operates in the environment

3-General content

› Biocontrol area and the current context of crop protection in relationship with sustainable agriculture and agroecology.

› Description of the different categories of biocontrol products (macro-organisms, micro-organisms, semiochemicals and natural substances).

› The biocontrol sector (Research & Development process, companies, marketing process, regulation, field use, etc).

4- Evaluation

› Individual exam on the different course content.

› Synthesis report and oral defense on a subject not developed during the courses.

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LIVESTOCK HOUSING AND BUILDING CONSTRUCTION

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JOOP LENSINK

1-Main objectives

› Gain knowledge and analyze the different aspects related to livestock housing influencing the animals' performances

› Go through all steps of a project by the realization of dairy barn building project for a farmer

› Advise farmers on building aspects and project

› Realize a building quality audit

2-Skills developed

› Conceive a cattle building project

› Advise farmers on building aspects and project

› Realize a building quality audit

3-General content

› Knowledge on animal needs, human constraints, administrative and legislative aspects, environmental regulations related to livestock building

› Future evolution in this area specifically in terms of innovation

› A major part of the knowledge on the topic of this module will be gained through the farm building project. The first visit will concern a dairy farmer that has a construction project; either a complete new building or an extension of an existing one. Students will have to identify the wishes of the farmer, the environmental, legislative and administrative constraints and realize finally building plans and budget plans for the project. The work will be evaluated through an "advisory" report and oral defense in front of the farm and an expert from the "farm building service" of the Chamber of Agriculture.

4- Evaluation

› Case study analysis with synthetic note to be written (20%)

› Report on the building construction project (60%)

› Oral presentation (45 min) by the groups of on their building project

› Synthesis report and oral defense on a subject not developed during the courses.

5- Program

Session	Duration	Topic / Method
Session 1	4h	**Lecture**: Introduction to livestock housing, animal behavior, basis of housing
Session 2	4h	**Visit**: dairy farm with construction project
Session 3 and 4	8h	**Lecture**: resting, feeding and thermal requirements
Session 5	4h	**Free session**: construction project
Session 6	4h	**Lecture**: environmental legislation, storage capacities of manure
Session 7	4h	**Lecture**: building concepts and automatization
Session 8	4h	**Lecture**: dairy calves housing and innovation
Session 9	4h	**Visit**: building concepts in several species
Session 10	4h	**Lecture**: ventilation and climate control

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PROJECT IN AGRICULTURE

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: FR OR EN
ECTS: 6
TEACHER/COORDINATOR: ERIC TAISNE

1-Main objectives

› Study a project in the farming sector, in response to the request of a partner (farmer or professional working in connection with farms)

› Meet the expectations of the partner, with a solution in relation to the demand

2-Skills developed

› Understand and analyze the problem.

› Define objectives.

› Manage a project (project schedule, anticipation of risks, evaluation of resources, distribution of tasks, taking into account the constraints)

› Develop relationships (in the group, with the partners, with the teacher)

3-General content

› Eleven days dedicated to the study, including one whole week.

› Projects presentation, choice of the groups and project assignments

4- Evaluation

› Intermediate evaluation after 3-4 work weeks

› Final oral evaluation in the presence of the partner, written report

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CROP MODELING

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: SITRAKA ANDRIANARISOA

1-Main objectives

› Integrate different steps of crop models design

› Understand formalities used to model different mechanisms occurring in the soil/plant/atmosphere system

› Use crop models to simulate the functioning of agroecosystems

› Discover some instances of the use of modeling by farmers.

2-Skills developed

› To be able to interact during the different steps of crop model design: conceptualization, formalization, parameterization, calibration and validation

› To be able to think about the modeling of multiple processes involved in crop production (soil/plant/atmosphere)

› To be able to use some models applied to crop management at farm scale.

3-General content

Lectures and concrete cases (36h) agroecology.

Topic	Teaching hour (h)
Definition, designing, parameterization, calibration and validation of crop model	8
Use of some crop models: simulation of agro-environmental performance of different crop management systems (e.g., variation in fertilizer inputs or in crop rotation/association, effect of climate change or soil type in crop production)	8
Models for weeds management, crop protection and fertilization	10
Examples of applied models: used in automatic robot, used in farm management	10

4- Evaluation

› Individual work to simulate some situations of crop systems

› Individual evaluation: written exam as multiple choice questions

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GEOPOLITICS OF FOOD

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: SABINE WEILAND (ESPOL) / BERTRAND VANDOORNE

1-Main objectives

Food covers immense terrain. It is at the intersection of competing issues such as production, consumption, supply chains, trade, government and politics, science and technology, nutrition, public health, environment, ethics, culture, social justice and many more. In this array, it is particularly difficult to design food policy on various levels and among diverse actor groups and demands. In this course, we will explore the contemporary global food system, the past, and possible futures for food policy. We will cover a number of core problems, such as food policy and governance, food production and consumption, food security and safety, health and the environment, food behavior and culture, and food poverty and justice.

2-General content

The course is taught through 12 lectures of 2 hours each. Each session contains also interactive elements, and students are encouraged to actively participate, ask questions and discuss issues of common interest. The lectures are designed to outline the topic in general, highlight illustrative examples and discuss some salient points. They are meant as an introduction to the topic at hand which enables the students of further self-study.
You are required to read the basic literature (see "Basic reading" in session overview) in preparation of the sessions.

3- Evaluation

› Regular attendance of the sessions is a requirement. Exams: 3 hours written exam (essay).

4- Program

› Session 1 – Introduction: The Geopolitics of Food

› Session 2 – Food as a Policy Field

› Session 3 – Food Governance

› Session 4 – Food Consumption

› Session 5 – Food Production and the Global Food Chain

› Session 6 – Food Security

› Session 7 – Food and the Environment

› Session 8 – Food, Ethics and Culture

› Session 9 – Food, Poverty and Social Justice

› Session 10 – The Future of Global Food Politics

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APPLIED AGRICULTURAL SCIENCES TO SPECIALIZED CROPS

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JÉRÔME MUCHEMBLED – ALI SIAH

1-Main objectives

› Understand the modes of action of biocontrol products.

› Integration of biocontrol products in cropping systems and agronomic advice.

› Know the organization and different actors of biocontrol area.

2-Skills developed

› Identify different categories of biocontrol and understand the sector

› Identify available biocontrol products for plant protection and crop production (arable crops and specialized crops)

› Understand how a biocontrol product operates in the environment

3-General content

› Biocontrol area and the current context of crop protection in relationship with sustainable agriculture and agroecology.

› Description of the different categories of biocontrol products (macro-organisms, micro-organisms, semiochemicals and natural substances).

› The biocontrol sector (Research & Development process, companies, marketing process, regulation, field use, etc).

4- Evaluation

› Individual exam on the different course content.

› Synthesis report and oral defense on a subject not developed during the courses.

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LIVESTOCK PRODUCTION SYSTEMS

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: VALÉRIE JACQUERIE – VANESSA GUESDON

1-Main objectives

› Enhance knowledge on cattle, sheep, pig and poultry farming techniques in France and abroad

› Identify the actors in these sectors

› Understand the issues and developments in the sector

2-Skills developed

› Production systems/markets (meat and milk)

› Analysis of technical and economic results

› Systemic approach to Livestock Production and Organization

› Compare breeding methods in different European countries

3-General content

Ten sessions: Courses/conferences, Visits + self-managed and personal work. Topics: Breeding of suckling cattle, pig breeding, breeding laying hens, sheep-goat farming

One Week: Study mission of 2-3 days, with preparation and restitution. Topic = Study of a theme according to destination (e.g. environment and competitiveness in the Netherlands).

4- Evaluation

Oral defense in group – Written report.

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INTRODUCTION TO SMART FARMING

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: BERTRAND VANDOORNE

1-Main objectives

This course sequence, taught in English, will propose to students an introduction to the new technologies used today in the agricultural sector, on field.

2-Skills developed

› Knowledge about new aspects and technologies regarding the agricultural techniques.

› Data analysis: work on huge data sets coming from sensors

› Self-learning through case study work.

3-General content

The lectures will approach techniques coming from the crop and animal productions.
These illustrated techniques will go from environmental or crop and animal health sensors to new mechanization technologies (i.e. robots). Some information and help decision tools will also be illustrated.

4- Evaluation

This short course sequence will be evaluated through a case study on which students will work. About 10 hours will be dedicated to this part.

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SUMMER INTERNSHIP

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: FR OR EN
ECTS: 6
TEACHER/COORDINATOR: SOPHIE DUPONT WARGNIEZ

All degree-seeking students at ISA Lille must carry out an "assistant engineer internship" (SAI) at the end of the bachelor or Master 1 year.

The main purpose of this internship, lasting for at least eight weeks (forty days), is to provide an immersion in the professional world in a field of the student's choice. This process of discovery helps to guide students in their future development and build career plans. It gives them the technical and interpersonal skills and knowledge of the business world that are essential for any engineer. The SAI enables students to immerse themselves in a company/sector that interests them, or to assist an executive (not necessarily an engineer) occupying a role they themselves would like to fill. The interns are given one or more missions relevant to the curriculum defined by ISA Lille and approved by the host organization.

The knowledge and skills to be acquired/developed through the internship may include:

- Scientific, technical, economic and/or regulatory knowledge about a subject
- Carrying out an analysis or consultancy mission with the appropriate tools
- Collecting and processing information and data and suggesting appropriate solutions
- Reporting information in a relevant way
- Working as part of a team
- Using interpersonal skills, adapting to the workplace and demonstrating professional ethics
- Demonstrating an ability to analyse and summarise
- Demonstrating initiative and independence
- Using creativity, ability to anticipate, imagination and a proactive approach
- The ability to question one's judgement

The internship will be evaluated based on the following:

- The internship mentor's assessment
- Internship report
- Validation interview with a referring teacher

The internship counts for 6 ECTS points (European credits) of the 60 ECTS points awarded for the fourth year of the engineering course.

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MAJOR IN ENVIRONMENTAL SCIENCE

Master of Science and Engineering Program

ISA Lille's Environmental Science program aims to give students a general overview of:

- *Prevention of soil pollution*
- *Water and air pollution*
- *Management and treatment of sites contaminated by human activities*
- *General assessment of pollution,*
- *Remediation/treatment of polluted sites (bioremediation, phytoremediation, biotechnology, and more)*

Contact

isa.international@yncrea.fr

English-Taught Courses

MASTER 1 - FALL SEMESTER	ECTS
Welcome Session	6
Project in Environment	6
Environmental Pollutants	3
Toxicology - Ecotoxicology	6
Pollutant Behavior in Abiotic Matrices	3
Waste Management	3
French as a Foreign Language	3

MASTER 1 - SPRING SEMESTER	
Geographical Information System(GIS) - Basic Knowledge	3
Soil Quality Investigation - Consultancy Tools	3
Scientific Project in Environment	6
Geostatistics	3
Human Risk Assessment	3
Waste Water Management	3
Water and Sediment Management	6
Audit Practices	3
French as a Foreign Language	3
Summer Internship	6

MASTER 2 - FALL SEMESTER	
Sustainable Management of Pollution	30

MASTER 2 - SPRING SEMESTER	
Final Internship	30
Six-month Professional Experience	
Written Report and Oral Defense	

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WELCOME SESSION

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
COORDINATOR: HÉLÈNE LERUSTE

1-Objectives and Skills developed

This welcome session is a mandatory course for any student from another university joining the first semester of Master 1 at ISA Lille (degree seeking or exchange students). It is an introductory course to the teaching at ISA Lille (scientific skills, communication skills, knowledge on agriculture and food chain). The objectives of the welcome session are to:

› Get used to the pedagogic methods, expectations and type of evaluations at ISA

› Introduce the lectures from the 4th year in agriculture and food chains

› Give reminders on scientific writing and communication methods

› Get to know each other and prepare to meet future colleagues from 4th year.

2-Content and Organization

Lectures – Workshops – Group work

SCIENTIFIC COMMUNICATION (33% of the credits)

› Prepare for future scientific work through a written and oral assignment on scientific topics

› 8h lectures on the methodology for a literature review/ 22h of work in small groups

› Evaluation: Individual literature review + Group oral presentation of a press review

FOOD CHAIN (33% of the credits)

› How are the food chain organized in the European context?

› 17h of lectures on food chain organizations / analysis of some specific food chains

› Evaluation: Individual exam

INTERCULTURAL COMMUNICATION and INTERPERSONAL SKILLS (17% of the credits)

› Get a glimpse at how cultural differences interact in our relationship and communication with others, and how communication between people works…

› 15h + 12h of workshop + 12

› Evaluation: exercises during the workshops + short individual report + participation in the workshops

NOTE: Non French speaking students will also take 15h of French as Foreign Language course

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PROJECT IN ENVIRONMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: FR
ECTS: 6
TEACHER/COORDINATOR: AGATHE COMBELLE

1-Main objectives

Manage, in a collaborative work, a long study dealing with an environmental issue.

2-Skills developed

› Use project management tools;

› Deliver your work in a strict and professional way;

› Understand and respond to a company issue;

› Technical skills, depending on the topic of the project.

3-General content

› Eleven days dedicated to the study, including one whole week.

› Project presentation, choice of the groups and the project assignment.

4- Evaluation

› Intermediate evaluation after 3-4 work weeks

› Final oral evaluation in the presence of the partner, written report

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ENVIRONMENTAL POLLUTANTS

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

› Understand the main issues challenges linked with contaminated areas

› Know the major pollutants in the environment

› Learn the main characteristics of such pollutants

2-Skills developed

› Be able to identify links between activities and pollution

› Practice collaborative group work: work, oral presentation, written report

3-General content

The physical environment of Western countries (air, water and soil) has been affected by a wide range of pollutants for centuries. Localized pollution from anthropogenic sources has been observed since the time of the Roman Empire. However, extensive pollution of the environment was a characteristic of the industrial revolution and major and widespread impacts have been observed throughout the nineteenth and twentieth centuries. Contaminated sites are the legacy of a long period of industrialization involving inconsiderate production and handling of hazardous substances and inadequate dumping of wastes. The expansion of industry and the increasing amount of industrial wastes have led to considerable environmental problems that apply in all industrialized countries. Nowadays, developing countries have to face the same problems.
This course will provide basic knowledge on main pollutants and their sources. Focus on specific pollutants and specific issues worldwide will be addressed as well.

4- Evaluation

Students will have to work both on a group project and an individual project.
Regarding the group project, students will have to identify on their own pollution and pollutants associated with activities they will discover during on field visits. A written report will have to be realized.
Regarding the individual project, students have to work individually on a specific project:

› introducing the problem of soil and/or water pollution in their own country: students must focus on some typical pollution or areas with specific problems;

› or exploring an existing management situation of a polluted area (case study) in their own country.

Each student will have the opportunity to present his work in front of the class, based on a PowerPoint presentation.

Finally, an individual written exam will be organized to verify acquisition of the essentials of the teaching unit.

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TOXICOLOGY - ECOTOXICOLOGY

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: BERTRAND POURRUT

1-Main objectives

› Understand the fate of pollutants in biotic matrices (bacteria, plants, animals); Get the basis on toxicology and ecotoxicology; Integrate this knowledge in ecosystems.

› Understand and use results from exposure and bioaccumulation experiments; results from ecotoxicological experiments with non-standard test species; results on the effects of chemicals on food-web.

2-Skills developed

› design in vivo bioassays to assess effects on behaviour of organisms;

› interpret the results of chemical fate and ecological models;

› interpret data from microcosm and mesocosm experiments;

› perform an advanced data analysis on chemical and biological monitoring data;

› perform advanced exposure, effect and risk assessments of chemicals in ecosystems

3-General content

This course will first focus on the fate of toxic compounds and their effects on animals and plants from single individuals to populations and ecosystems. It is organized in lectures dealing with the:

› main exposure routes (inhalation, ingestion, contact…);

› mechanisms of bioconcentration, bioamplification and bioaccumulation;

› main mechanisms of pollutant toxicity;

› main mechanisms of pollutant detoxification;

› effects on populations and ecosystems.

Then, a focus will be done on Environmental risk assessment. ERA is a process for estimating the likelihood or probability of an adverse outcome or event due to pressures or changes in environmental conditions resulting from human activities.

4- Evaluation

Individual written exam and oral group presentation with activities they will discover during on field visits. A written report will have to be realized.

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POLLUTANT BEHAVIOUR IN ABIOTIC MATRICES

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

› Understand the main chemical reactions between pollutants and chemical species in the contaminated matrices (soil, sediment, water…)

› Comprehend the complexity of chemical processes

2-Skills developed

› Read an analysis report and extract the most relevant information;

› Discuss data on the analysis report (agronomic and physico-chemical properties);

› Develop ideas to participate to the elaboration and set up of strategies to evaluate the environmental availability of metallic and organic pollutants.

› Evaluate, analyze and, from a theoretical point of view, predict the behaviour of pollutants in soils and the main retention and depollution processes which are active in the soil-water system.

3-General content

› the main chemical reactions between pollutants and chemical species in the contaminated matrices (soil, sediment, water…)

› the students will be able to link the behaviour of xenobiotics in the soil-water system to the physical and chemical characteristics of both pollutant and soil/sediment under investigation, to report on specific themes related to the fate of pollutants into soil and water, and to approach scientific reports dealing with the evaluation and assessment of pollution phenomena in the soil and water environment

4- Evaluation

Individual written exam and written report

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WASTE MANAGEMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

› Acquire basic knowledge, and fundamental benchmarks in the area of waste management;

› Knowing the context, environment, actors, and tools dedicated to waste management;

› Get a «waste management» culture to be able to understand waste management study on company scale or for household waste management;

› Integrate elements of understanding, related to the Circular Economy. This teaching unit is focusing on Waste management tools, on their complete cycle, from production to treatment facilities including the steps of pre-collection, collection, transfer and transport.

2-Skills developed

› Analyze equipment and results of waste management practices;

› Set-up waste management solutions, technically, economically and in terms of communication;

› Integrate elements of understanding, related to the Circular Economy.

3-General content

The idea is:

› to get used to the fundamentals (terminology, treatment types, regulations, technico-economic approach...) of household waste and waste of economic activities;

› to develop a type of waste, or sector, or a treatment process, through a case study;

› to visit a rather complete panel of processing plants (dumping sites, incinerators, recycling companies...)

4- Evaluation

Written report in group, group oral defense, individual written exam

Return to Course List

GEOGRAPHICAL INFORMATION SYSTEM (GIS) - BASIC KNOWLEDGE

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: SÉBASTIEN DÉTRICHÉ

1-Main objectives

The learning outcomes are to acquire basic skills on GIS by using the QGIS software (free and open source):

› understanding different GIS fields of application;

› mastering the basic tools of the QGIS software;

› understanding data (vector and raster) and metadata, deal with spatial data;

› making of thematic maps (with review of cartography rules);

› knowing how and where acquiring data (data sources);

› learning how to solve environmental problems and apply GIS solutions (polluted sites, soil science, agriculture, landscape management...)

2-Skills developed

› Know how to use a GIS software (QGIS)

› Use GIS to deal with environmental issues

3-General content

Guided step-by-step practical work on the software with exercises. Students will work with worldwide and regional (Nord-Pas de Calais) data.

› What is a GIS? How to deal with spatial data? Fields of application, basic knowledge about GIS
› The QGIS interface. Dealing with layers and their properties (graphic and attributary), coordinate systems
› The table of contents, toolbars, definition queries
› Symbology and labelling
› Georeferencing, coordinate systems
› Editing and layout (creating maps)
› Making selections
› Joining data (from the database to the GIS)

4- Evaluation

Individual exam on the software

Return to Course List

SOIL QUALITY INVESTIGATION - CONSULTANCY TOOLS

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

› To provide knowledge on soil quality investigation, through an exploration of general approaches in this field, and through a comparison of 2 specific approaches: the Dutch one and the French one.

› Understand the main issues and goals linked with soil investigations;

› Be aware of different kind of sampling methods and equipment;

› Learn about conservation methods and about main analytical techniques.

2-Skills developed

› Be able to build a financial and technical proposal for a classical pollution diagnosis case;

› Be able to make interpretations and evaluations based on the analysis reports;

› Technical skills in the field of soil quality investigation (sampling tools…)

› Practice collaborative group work.

3-General content

Courses, lectures and field visits:

› **Lecture about French approach on soil quality investigation**
This lecture will first give a definition of the goal of investigation in the French approach. The different kind of sampling strategies will be presented, and the way to choose the type and the number of chemical analyses that have to be done. A lot of real cases and examples will be brought to the students during this lecture in support.

› **Lecture about Dutch approach on soil quality investigation**
Those lectures will first propose an introduction to soil pollution problems in the Netherlands. Then, the soil protection policy and legislation in the Netherlands will be highlighted.
Next, a definition of the goal of investigation in the Dutch approach will be given.
Then, the standard protocol for preliminary soil quality investigation will be detailed. The different kind of sampling strategies will be presented, and the way to choose the type and the number of chemical analyses that have to be done.
During the final part of this lecture the techniques for writing a summary report will be presented and the case study will be introduced.

› **Case study – soil investigation "Garage de Vries"**
Following those first lectures, students will have to work on a specific case study. Students will be split in different groups and will have to play the role of young engineers working in a consulting agency (One group of students = one consulting agency).

Based on the same document introducing the site, each group will have to build the best proposal (from the technical and financial point) according to the customer needs. This proposal, presenting a sampling plan with the different drillings and chemical analysis proposed, will have to be justified and explained during a short oral presentation. There will be opportunities for class comments/feedback/discussion after each presentation.
The exercise will have to be done using both the French and Dutch methodology. An open discussion about the main differences observed will then be done with the students.

- **Lecture on soil quality standards and risk assessment & interpretation of the results of chemical analysis**

During these last lectures within Dutch framework, the topics of soil quality standards and interpretation of results will be presented and discussed.

- **Field visit: On-going soil investigations**

Students will have the opportunity to visit a site where soil investigations are held. This will be a good opportunity to observe the way this is done and the drilling and sampling equipment.

- **Study tour (to be confirmed) – Cooperation with AVANS Breda and TAMPERE Finland**

The cooperation will consist of a two day project case, scheduled in January.
The detailed content will be updated in due time.)

4- Evaluation

Group oral presentation and individual written exam based on the lectures.

Return to Course List

SCIENTIFIC PROJECT IN ENVIRONMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

The objective of this "Professional Project" is for the student to understand the expectations of an industrial partner and to be able to communicate and collaborate with different actors of professional world.

2-Skills developed

› Project management skills: global management of a project (in multicultural team), planning, organization, reporting and feedback…

› Technical skills, depending on the topic of the project.

3-General content

› Eleven days dedicated to the study, including one whole week.
› Projects presentation, choice of the groups and the project assignment

4- Evaluation

› Intermediate evaluation after 3-4 work weeks

› Final oral evaluation in the presence of the partner, written report

Return to Course List

GEOSTATISTICS

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: SÉBASTIEN DÉTRICHÉ

1-Main objectives

› Manage a polluted site study, from the preparation of the sampling campaign to the creation of maps using geostatistics;

› See how geostatistics can help make decisions when dealing with polluted site studies.

2-Skills developed

› Preparing and doing a sampling campaign on polluted sites

› Basic knowledge on how to use ArcGIS and the geostatistical analyst tool

› Spatialize data using geostatistics techniques = interpolations;

› Basic knowledge of kriging and variography;

› Mapping pollution by taking into account interpolation uncertainties;

› Creating probability maps.

3-General content

Practical work and case study by group
1 – Field sampling methodology (around the former Metaleurop smelter)
2 – Introduction to the ArcGIS software (GIS reminder)
3 – Introduction to geostatistics (definitions, applications), the Geostatistical Analyst tool
4 – Exploratory Data Analysis (basic statistics)
5 – Variography and prediction (ordinary kriging)
6 – Exercises and case study
7 – Self directed time to prepare the oral presentation of the case study

4- Evaluation

› Group report on the field investigation (field sampling)

› Group presentation about the case study

Return to Course List

HUMAN RISK ASSESSMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

› Know the difference in meaning of the terms “hazard” and “risk”, the purpose and the four steps of risk assessment,

› Know the most common routes for absorption of substances into the body,

› Have an understanding of integrating the results of hazard identification, hazard characterization, and exposure assessment,

› Be familiar with the problems in extrapolating the results of studies of the harmful effects of substances from animals to humans and know what are the main sources of hazard information on commercially available substances,

› Understand the principles of exposure assessment,

› Know some of the common approaches to minimizing risk,

› Know how to progress from risk assessment to risk management.

2-Skills developed

Introduction to: human risk assessment concepts, risk calculation (from theory to practice), computerized models for assessment of contaminated land exposure

3-General content

Human risk assessment concepts:

› Definitions: hazard, exposure, risk, dose-response, risk perception, risk communication, risk characterization…
› How to carry out risk assessment? Risk assessment process
› Sources of uncertainty in risk assessment
› From risk assessment to risk management

4- Evaluation

› Individual evaluation: written test about the lecture
› Group evaluation: oral presentation (group project on a case study)

5- Program

› Lecture
› Examples: introduction to computerized models for human risk assessment
› Practical (exercises on risk calculations)
› Case study (group project of 3/4 students)

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WASTE WATER MANAGEMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

Upon completion of this course students should be able to understand the big challenges that companies have to face with:

› the reduction of the water use,

› the management of the waste water,

› the re-purposing of treatment by-products.

2-Skills developed

Both technical skills and operational skills.

3-General content

The course will be illustrated with short practical exercises, to be performed by students, and on-site visits (waste water treatment plant of municipality and company).

The lectures will address the following topics:

› Industrial water management;

› Wastewater treatment: principles and implementation;

› Water reuse, re-purposing of by products, and case studies;

› Industrial wastewater specific treatment: principles and implementation.

4- Evaluation

Individual written exam based on the lectures and case studies done

Return to Course List

WATER AND SEDIMENT MANAGEMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

Learning outcomes:

› Understand the main issues and challenges about water and sediment pollution, in France and in Europe

› Learn about the French and Dutch specific approaches on this topic.

2-Skills developed

› Practice collaborative group work: work, oral presentation, written report…

› Perform GW monitoring and sampling operations

› Analyze survey reports, maps and data

3-General content

The course will include many different lectures about this topic, from different actors, showing different perspectives + a lot of field visits, in France and in the Netherlands.

› **Water Management:**

- Specific cases of Water Management:
Example of Friesland region in The Netherlands (lecture from Friesland region water board + boat trip).
At the European Level: presentation of Integrated Management of Water Resources (lectures and serious game)
- Sustainable Water Technology: visit of WETSUS center of excellence for water technology (Leeuwarden) + CEW (Center of Expertise Water Technology)
- About Groundwater topic: field visit (groundwater sampling tools) + practical (groundwater quality)
- Other field visits (visit of the biggest groundwater pumping facility of The Netherlands…)

› **Sediment Management:**

Specific approach of sediment management in The Netherlands: lectures and field visits (dredging work/deposit places/sludge treatment facility…)
Specific approach of sediment management in France: lectures and field visits.

4- Evaluation

Practical in lab, group assignments and individual written exam based on the lectures, visits.

Return to Course List

AUDIT PRACTICES

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIEN CASTELIN

1-Main objectives

The learning outcomes of this teaching unit are to train students in audit practices and for them to understand the different types of audits (Internal, external, follow-up, renewal etc…).

2-Skills developed

The main skills developed are:

- Organizational management of an audit: Planning, opening meeting, carrying out the audit, closing meeting, audit report...
- Soft-skills : during the audit: active listening, goodwill, advice
- Analytical mind
- Typology of deviations.

3-General content

- The key steps for a successful audit will be introduced and discussed
- The teaching unit will combine theoretical lectures, based on internal audit standard NF EN ISO 19011 and case studies.
- The most popular ISO standards (Quality management, Environmental management...) will be used to train students.
- Students will have the opportunity to lead their own audit.

4- Evaluation

In groups, students will conduct an internal audit.

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SUMMER INTERNSHIP

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: FR OR EN
ECTS: 6
TEACHER/COORDINATOR: SOPHIE DUPONT WARGNIEZ

All degree-seeking students at ISA Lille must carry out an "assistant engineer internship" (SAI) at the end of the bachelor or Master 1 year.

The main purpose of this internship, lasting for at least eight weeks (forty days), is to provide an immersion in the professional world in a field of the student's choice. This process of discovery helps to guide students in their future development and build career plans. It gives them the technical and interpersonal skills and knowledge of the business world that are essential for any engineer. The SAI enables students to immerse themselves in a company/sector that interests them, or to assist an executive (not necessarily an engineer) occupying a role they themselves would like to fill. The interns are given one or more missions relevant to the curriculum defined by ISA Lille and approved by the host organization.

The knowledge and skills to be acquired/developed through the internship may include:

- Scientific, technical, economic and/or regulatory knowledge about a subject
- Carrying out an analysis or consultancy mission with the appropriate tools
- Collecting and processing information and data and suggesting appropriate solutions
- Reporting information in a relevant way
- Working as part of a team
- Using interpersonal skills, adapting to the workplace and demonstrating professional ethics
- Demonstrating an ability to analyse and summarise
- Demonstrating initiative and independence
- Using creativity, ability to anticipate, imagination and a proactive approach
- The ability to question one's judgement

The internship will be evaluated based on the following:

- The internship mentor's assessment
- Internship report
- Validation interview with a referring teacher

The internship counts for 6 ECTS points (European credits) of the 60 ECTS points awarded for the fourth year of the engineering course.

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MAJOR IN FOOD SCIENCE

Master of Science and Engineering Program

ISA Lille's Food Science program aims to give students:

- an international view of food safety regulations and standards, highlighting local and international specificities
- tools to assist food companies in setting up systems (HACCP, BRC, IFS, SQF, ISO 22000, FSSC 22000, ISO 14001 and ISO 9001) and performing audits (preparation for internal auditor certification exam)
- an overview of theories, concepts and methodologies of company resource planning systems
- a practical view of food industry management, through lectures and seminars by professionals of the sector
- methods to manage projects in an international context, with multicultural staff

Contact

isa.international@yncrea.fr

English-Taught Courses

MASTER 1 - FALL SEMESTER	ECTS
Welcome Session	6
Food Tech Project - Introduction	6
Quality Assurance and HACCP	3
Unit Operations	6
Applied Statistics	3
Bioprocess	3
French as a Foreign Language	3

MASTER 1 - SPRING SEMESTER	
Industrial Internship	3
Production Management	3
Product Formulation or Food Tech Project	6
Ingredients	3
Nutrition	3
Sensory Evaluation	3
Physical, Chemical, and Microbiological Characterization of Food Products	3
French as a Foreign Language	3
Summer Internship	6

MASTER 2 - FALL SEMESTER	
Two specializations: – Sustainable Product Development: Ecodesign – Quality Management Systems in Agrofood	30

MASTER 2 - SPRING SEMESTER	
Final Internship	30
Six-month Professional Experience	
Written Report and Oral Defense	

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WELCOME SESSION

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
COORDINATOR: HÉLÈNE LERUSTE

1-Objectives and Skills developed

This welcome session is a mandatory course for any student from another university joining the first semester of Master 1 at ISA Lille (degree seeking or exchange students). It is an introductory course to the teaching at ISA Lille (scientific skills, communication skills, knowledge on agriculture and food chain). The objectives of the welcome session are to:

› Get used to the pedagogic methods, expectations and type of evaluations at ISA

› Introduce the lectures from the 4th year in agriculture and food chains

› Give reminders on scientific writing and communication methods

› Get to know each other and prepare to meet future colleagues from 4th year.

2-Content and Organization

Lectures – Workshops – Group work

SCIENTIFIC COMMUNICATION (33% of the credits)

› Prepare for future scientific work through a written and oral assignment on scientific topics

› 8h lectures on the methodology for a literature review/ 22h of work in small groups

› Evaluation: Individual literature review + Group oral presentation of a press review

FOOD CHAIN (33% of the credits)

› How are the food chain organized in the European context?

› 17h of lectures on food chain organizations / analysis of some specific food chains

› Evaluation: Individual exam

INTERCULTURAL COMMUNICATION and INTERPERSONAL SKILLS (17% of the credits)

› Get a glimpse at how cultural differences interact in our relationship and communication with others, and how communication between people works…

› 15h + 12h of workshop + 12

› Evaluation: exercises during the workshops + short individual report + participation in the workshops

NOTE: Non French speaking students will also take 15h of French as Foreign Language course

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FOOD TECH PROJECT - INTRODUCTION

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: VINCENT DUMORTIER/EMMANUELLE MARTIN

1-Main objectives

› Refresher course in biochemistry and food microbiology. Acquisition of laboratory techniques.

› Mobilize knowledge and skills in food science to resolve a concrete technical issue presented in a professional setting. The project will be presented in the form of a problem arising in an industrial context (either an exterior sponsor or at ISA with a link to an external study).

2-Skills developed

› Work in a team with colleagues and in collaboration with the school or partner firm and use project management tools.

› Produce results in a rigorous and professional manner.

3-General content

› Around 100 hours dedicated to the projects

› Microbiology: class, practicals, case study

› Biochemistry: class, practicals, case study

› One full week dedicated to a case study

› Bibliographical study/latest developments on the project; proposition of an action plan and a methodology for addressing the issue; Experiment design; Critical analysis of results, summary report of work done.

4- Evaluation

Intermediate evaluation (report and presentation of case study results): 75%
Final evaluation: Poster (s): 25%

Return to Course List

QUALITY ASSURANCE AND HACCP

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: CAROLINE KACZMAREK

1-Main objectives

› Understand the concept of quality, its added value and impact

› Understand how to define quality in a particular context

2-Skills developed

› Be able to identify links between food regulations and HACCP

› Be able to create a process diagram: description of the purpose and benefits of process mapping

› Be able to develop the HACCP methodology

3-General content

The principles of quality and of the HACCP methodology.
Lectures, tutorials and company visit.

› What is quality, what are the principles of quality, how to develop a quality management system?

› Focus on ISO 9001, quality standards, labels and strategies

› Continuous improvement and problem solving tools

› Presentation of the food hygiene package

› Process mapping : SIPOC, Top Down, Functional Deployment approaches

› Study of the prerequisite programs

› HACCP : 12 steps for 7 principles.

4- Evaluation

Written reports

Return to Course List

UNIT OPERATIONS

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: LEANDRO GALVAN

1-Main objectives

Unit Operations in Agri-Food Engineering deals with the design and selection of process equipment or process plants. Each piece of equipment that could be combined to make a «unit» in a process should have a clearly defined function. For example: mixing, separating solids and liquid, separating mixtures from fluids, size separation of solid particles, or transport of a fluid. The number of the most important and basic Unit Operations is not very large and are governed by the fundamental laws of mathematics, physics, chemistry, and mechanics, which provide an approximate description of the real processes. The 'Unit Operations' concept allows for the analysis of unit operations in terms of fundamental principles such as mass and energy balances, phase equilibria, and transport of momentum, energy and mass. In this course we examine a systematic way of approaching design and selection of process equipment.

2-Skills developed

› Name the main unitary operations used in the industry, give specific definitions of them and sort them into relevant categories. The operations evoked in the course are sterilization, frozen, filtration, drying, atomization (spray drying).

› Name several precise examples of industrial applications for each unitary operation

› Describe precisely the working principle of each unitary operation both at the macroscopic scale (in flow, out flow, energy flows) and at the microscopic level (particle, interface, molecule). This description will concern both the physical and chemical phenomena involved and the thermodynamic and kinetic constraints that dictate the separation.

› Identify to operating parameters that determine the efficiency of each process

› Calculate mass and energy balance for discontinuous, semi-continuous and continuous processes and dimensioning the facilities that allow to perform them

› Re-write and interpret the main mathematical developments that lead to the useful equations for process dimensioning and remember at the same time what are all the simplifying hypotheses that must sometimes be used to establish models and dimensioning methods.

› Apply empirical, analytical and graphical methods classically used for unitary operation dimensioning.

› Gather information (field visits, literature search, interviews, etc.) on a unitary operation involved in an existing industrial process and elaborate a critical analysis of this step of the process, describing its interactions with previous and subsequent steps, evaluating if its operating conditions are optimal and providing recommendations for improvement (in addition to technical and economic criteria, the standards of 'sustainable development' will also be used as evaluation benchmarks).

3-General content

Lectures, practical class, visits of food plant, project.

- Thermal unit operations (evaporation-concentration, spray-drying, heat treatments).
- Mechanical processes for physical separation: sedimentation, decantation, centrifugation, filtration, cycloning, membrane separation, solid-liquid extraction.
- Drying processes: drying, lyophilisation, atomisation.
- Diffusion, mass transfer and energy transfer between phases (diffusion theory, mass transfer coefficients, film theory).
- Phase equilibrium.

4- Evaluation

Written reports on practicals, written exam

Return to Course List

APPLIED STATISTICS

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: SYLVIE CHOLLET

1-Main objectives

To take into account the multiple backgrounds, this course is designed to improve basic and advanced knowledge of statistics and probabilities

2-Skills developed

Being able to master all relevant statistical tools related to statistical quality control, process control and R&D in Food Science.

3-General content

Tutorial class essentially, interactive lecture, problems, real case studies

- Basic Statistics: tables, charts
- Numerical descriptive measures
- Basic probabilities (events, Bayes, conditional)
- Discrete distributions (Binomial, Poisson, Hypergeometric…)
- Continuous Distributions (Normal, Fisher, Student…)
- Sampling
- Confidence Intervals (mean, proportion…)
- Hypothesis Testing
- Single and Multiple Sample tests (parametric and non parametric)
- ANOVA (one way, two ways, randomized block design)
- Post Hoc Tests (Tukey…)
- PCA, CA, HAC, MCA

4- Evaluation

Presentation of case study analyze in groups of 3 or 4 students.

- 50% written presentation (Power point)
- 50% oral presentation

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BIOPROCESS

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN (FR IN SEMESTER 2)
ECTS: 3
TEACHER/COORDINATOR: CAROLINE CHOMA

1-Main objectives

Discoveries and uses of biotechnology and bioprocesses – agro-industry and agriculture applications.
In this teaching unit, students will have a view on the complexity of bioprocesses:

› Microbial biomass production;

› Fermented foods production;

› Biomolecules used in food industries, food products and agriculture

2-Skills developed

› To comprehend the complexity of bioprocesses;

› To better grasp the opportunity to participate in the development and implementation of strategies and action plans for a sustainable food industry;

› To analyze and solve quality problems associated with fermented foods or compounds obtained thanks to the use of bioprocesses (from a scientific and technical point of view).

3-General content

Lectures/conferences; Visiting companies (Roquette, DSM, Lesaffre, etc); Tutorial work and or Practical work (biomass production and yield of production calculation)

1. INTRODUCTION (bioprocesses and biotechnology definitions).

2. MICROORGANISMS POTENTIALITIES: What are they? and their life dissection (nutrient requirements; biomass production & anabolism; growth phases)

3. VARIOUS USES, INDUSTRIAL APPLICATIONS: What characteristic/specificity of a microorganism is used and for what application or which final industrial product? (Primary and secondary metabolites; Enzymes...).

4. PROCESSES AND EQUIPMENT/ HOW TO MANAGE BIOPROCESSES (Biomass production; Equipment: and their control devices; Culture management).

5. OPTIMIZATION AND PERSPECTIVES

4- Evaluation

Written works

Return to Course List

INDUSTRIAL INTERNSHIP

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN OR FR
ECTS: 3
TEACHER/COORDINATOR: CAROLINE KACZMAREK

1-Main objectives

Performing a two-week internship in the food industry.

2-Skills developed

› Upon completion of this course, students should be able to define better his or her professional objectives

› To prepare the assistant executive internship (2 month at the end of the academic year)

› To conceptualise and formalise internship results by writing a structured report

3-General content

› How to write a CV and a cover letter

› Performing a two-week internship in the food industry

› Debriefing about the internship

4- Evaluation

Written report – Skills evaluated by the company

Return to Course List

PRODUCTION MANAGEMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN (FR IN ANOTHER PERIOD OF S2)
ECTS: 3
TEACHER/COORDINATOR: PIERRE VANDENDRIESSCHE

1-Main objectives

› Discover and understand the typical organization of a food production company (business processes, departments, jobs and missions)

› Discover and understand the various flows involved

› Reflect on team management skills

2-Skills developed

› Discover and understand the key business processes involved in an industrial food production environment

› Acquire the fundamental vocabulary related to industrial food production and supply chain

› Understand the data required in how it is structured / managed

› Understand the physical, data and financial flows

› Discover the use of an ERP system

› Understand the junior team manager's legal framework

› IT skills: how to structure data and produce sensible KPIs

› Running supply chain processes in an ERP system

› Reflect on the knowledge and behavior of the junior team manager in a food factory

› Adapt to social context

3-General content

Lectures, tutorials, visit of food plant, serious game.

› Industrial organization

› Material handling

› Demand and supply planning

› Labor & HR

› ERP

4- Evaluation

Exam, serious game results ranking against other competing teams

Return to Course List

PRODUCT FORMULATION

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN (FR IN SEMESTER 1)
ECTS: 6
TEACHER/COORDINATOR: CHARLES DERMONT

1-Main objectives

Propose a methodology based on the bench marking of a food product available on the market – to develop a prototype with physicochemical and sensory characteristics the closest as possible to the target.

2-Skills developed

› Design a food product.

› Determine the appropriate microbiological and physicochemical analyses.

› Understand ingredients-ingredients and ingredients-process interactions.

› Carry out the sensory evaluation of a food product by using adapted methodology.

› Analyze the results, propose clear recommendations and communicate them.

3-General content

› Project – group work. Use of laboratories (Microbiology, chemistry, sensory analysis).

› Tools to help in the formulation and design of products

› Project of bench marking of a food product

› Rapid techniques of microbiological controls

› Sensory evaluation: discriminative techniques

4- Evaluation

Intermediate and final assessment

Return to Course List

FOOD TECH PROJECT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: VINCENT DUMORTIER/EMMANUELLE MARTIN

1-Main objectives

› Mobilize knowledge and skills in food science to resolve a concrete technical issue presented in a professional setting. The project will be presented in the form of a problem arising in an industrial context (either an exterior sponsor or at ISA with a link to an external study).

2-Skills developed

› Work in a team with colleagues and in collaboration with the school or partner firm and use project management tools.

› Produce results in a rigorous and professional manner.

3-General content

› Group work – Learning by technical case study – A project is completed successfully by a group of 3-4 students, supervised by a permanent teacher. Five main topics on food could be proposed: Analytic – Method – Raw Materials or Ingredients – Microbiology or Sensory

› The overall work period for a project is approximately 150 hours linked with 12 full project days during the semester. As a general rule, every Tuesday for 8 weeks, plus one full week reserved especially for projects.

› After a session for presenting the projects and training in project management, the work is completed autonomously (conception of experiments) with technical supervision (pilot food plant or laboratory).

› Bibliographical study/latest developments on the project; proposition of an action plan and a methodology for addressing the issue; Experiment design; Critical analysis of results, summary report of work done

› Examples of project: Limit of the Brix Method for the determination of dry material – Dosage of sugar by HPLC – Enzyomes and fruit juice – Reserve osmosis – Feasibility study of putting into kegs – Candying – Egg whites/ Meringue – Tomato sauce: effects of texturizers – Study of the Maillard reaction – Study on biofilms – Setting up a new sensory analysis test.

4- Evaluation

Presentation and report or other deliverable for the partner firm.

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INGREDIENTS

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: LAUREEN SIMON

1-Main objectives

› To have basis knowledge of ingredients to formulate food products.

› Acquire knowledge to understand food formulation

› Know functionalities and implementation of main ingredients and additives used in food industry

› Food regulation

2-Skills developed

Know how to propose a list of ingredients in adequation with desired formula

3-General content

Lectures by professionals and practicals.

› food formulation

› study of main ingredients, additives and processing aid (functionality, implementation, storage and preservation)

› aromas

› food regulation

› practical with gelling agents and thickeners

4- Evaluation

70% individual written final exam

30% Report or oral defense in a group

Return to Course List

NUTRITION

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN (FR IN ANOTHER PERIOD OF S2)
ECTS: 3
TEACHER/COORDINATOR: LUCILE GABEREL

1-Main objectives

› Acquire fundamental notions of nutrition.

› Understand the importance of nutrition in an agrifood company and its place in strategy, communication, new product development, etc.

› Know the regulations about food and nutrition labeling.

› Have an overview of nutrition issues and politics around the world.

2-Skills developed

› Calculation of a human food ration and of the nutritional values of a food product

› Nutritional audit approach

› Researches on official websites

3-General content

› Fundamentals in nutrition: nutritional needs for different groups of population, balanced diet, link between nutrition and health

› Regulations about food and nutritional labeling

› Nutrition approach in food companies, nutritional audit methodology

› Nutrition situation and policies around the world

› Visit of Danone Research Center

4- Evaluation

Oral presentation 40%
Written exam 60%

5- Program

1	2	3	4 and 5
Wed. 21/02	Thu. 22/02	Mon. 26/02	Fri. 02/03
Lecture	**Lecture**	**Lecture**	**Lecture + practical**
Nutrition basics Balanced diet	Balanced diet **Practical** Food ration calculation	Specific populations nutritional needs Health issues related to nutrition	Nutrition labeling **Self-directed time** Research for group project

6 and 7	8	9	10
Wed. 14/03	Thu. 15/03	Wed. 21/03	Fri. 23/03
Outing	**Lecture + practical**	**Oral presentations**	**EXAM**
Danone Research Center	Nutrition in an agrifood company Nutritional audit approach	Group project	

Return to Course List

SENSORY EVALUATION

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: MAUD DESMAS

1-Main objectives

This course is dedicated to students interested in Quality, R&D and Marketing departments of food companies.

Knowing the different categories of sensory tests, their methodology and their applications in food industry

2-Skills developed

› Conducting a sensory test from A to Z

› Analyzing and interpreting sensory data with statistical tools

› Reporting sensory results in a professional style

3-General content

Sensory evaluation is a unique discipline, today integrated in the decision making of many food and non-food companies. It is used to study the consumers' preferences, to describe a market. The sensory characteristics of a product and/or its presentation need to be considered from its conception, and then followed during production to guarantee the quality and the success of the product. The knowledge of sensory properties is regarded as a major control key of the quality perceived by the consumers.

Lectures, Practicals/Tutorials, Group project

› Fundamental principles of sensory evaluation

› Basics of sensory physiology

› Setting up of sensory evaluation: sensory lab, assessors, sample presentation

› Discriminative tests: triangular test, duo-trio, etc.

› Descriptive tests: QDA profile, alternative methods (Flash, CATA, tri, etc.)

› Consumer tests

› Preference mapping

4- Evaluation

Group written report – Group oral presentation – Individual exam

Return to Course List

PHYSICAL, CHEMICAL, AND MICROBIOLOGICAL CHARACTERIZATION OF FOOD

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN (FR IN SEMESTER 1)
ECTS: 6
TEACHER/COORDINATOR: VINCENT DUMORTIER

1-Main objectives

This option is intended for students interested in R & D services, Quality or Production in agro-food industries. It is a technical approach to food science. Food products will be studied through three analytical domains: Physico-chemical, Rheology, and Microbiology.

2-Skills developed

› Contribution to knowledge of food composition through physico-chemical analysis

› Technological characterization of food through rheological or colorimetric analysis

› Microbiological characterization of foods

› Improvement of the student technical skills through new technologies and procedures of chemical, and physical characterization of food

› Acquisition of a critical mind towards analytical methods, procedures and their results

3-General content

Lectures, practicals, visits

› Biochemical and nutritional analysis (fats, proteins, carbohydrates, dry matter, minerals, vitamins...)

› Physical analysis (rheology of solid, liquid, colorimetry of food…)

› Interpretation of experimental data

› Microbiological analysis of foods

› Visit of a food analysis laboratory

Practical cases of analytical characterization will be carried out on the food-products that it will be duplicated in Project in Food Sciences – Formulations.

4- Evaluation

Written reports (practicals), individual written exam

Return to Course List

SUMMER INTERNSHIP

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: FR OR EN
ECTS: 6
TEACHER/COORDINATOR: SOPHIE DUPONT WARGNIEZ

All degree-seeking students at ISA Lille must carry out an "assistant engineer internship" (SAI) at the end of the bachelor or Master 1 year.

The main purpose of this internship, lasting for at least eight weeks (forty days), is to provide an immersion in the professional world in a field of the student's choice. This process of discovery helps to guide students in their future development and build career plans. It gives them the technical and interpersonal skills and knowledge of the business world that are essential for any engineer. The SAI enables students to immerse themselves in a company/sector that interests them, or to assist an executive (not necessarily an engineer) occupying a role they themselves would like to fill. The interns are given one or more missions relevant to the curriculum defined by ISA Lille and approved by the host organization.

The knowledge and skills to be acquired/developed through the internship may include:

› Scientific, technical, economic and/or regulatory knowledge about a subject

› Carrying out an analysis or consultancy mission with the appropriate tools

› Collecting and processing information and data and suggesting appropriate solutions

› Reporting information in a relevant way

› Working as part of a team

› Using interpersonal skills, adapting to the workplace and demonstrating professional ethics

› Demonstrating an ability to analyse and summarise

› Demonstrating initiative and independence

› Using creativity, ability to anticipate, imagination and a proactive approach

› The ability to question one's judgement

The internship will be evaluated based on the following:

› The internship mentor's assessment

› Internship report

› Validation interview with a referring teacher

The internship counts for 6 ECTS points (European credits) of the 60 ECTS points awarded for the fourth year of the engineering course.

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MAJOR IN AGRICULTURAL ECONOMICS, MARKETING & MANAGEMENT

Master of Science and Engineering Program

ISA Lille's Agricultural Economics, Marketing and Management program aims to give students:

› *an international view of the issue of agricultural trade and finance, highlighting certain national and/or regional specificities*
› *the necessary tools to manage business development and communication*

› *the necessary tools to manage agricultural trade, from purchase and procurement to industrial marketing and consumer behavior*

› *a practical view of site management, thanks to lectures and seminars by experts in the field*

› *methods to manage projects within an international context, with multicultural staff.*

Contact

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English-Taught Courses

MASTER 1 - FALL SEMESTER	ECTS
Welcome Session	6
Introduction to Finance	3
Export	6
Decision Tools: Statistics and Market Research	3
Introduction to Marketing	3
French as a Foreign Language	3

MASTER 1 - SPRING SEMESTER	
Purchase and Procurement	3
Digital Business	3
B-to-B Marketing	3
Business Development	3
French as a Foreign Language	3
Summer Internship	6

MASTER 2 - FALL SEMESTER	
Trade, Consumerism, and Marketing	30

MASTER 2 - SPRING SEMESTER	
End-of-Study Internship	30
Six-month Professional Experience	
Written Report and Oral Defense	

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WELCOME SESSION

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
COORDINATOR: HÉLÈNE LERUSTE

1-Objectives and Skills developed

This welcome session is a mandatory course for any student from another university joining the first semester of Master 1 at ISA Lille (degree seeking or exchange students). It is an introductory course to the teaching at ISA Lille (scientific skills, communication skills, knowledge on agriculture and food chain). The objectives of the welcome session are to:

› Get used to the pedagogic methods, expectations and type of evaluations at ISA

› Introduce the lectures from the 4th year in agriculture and food chains

› Give reminders on scientific writing and communication methods

› Get to know each other and prepare to meet future colleagues from 4th year.

2-Content and Organization

Lectures – Workshops – Group work

SCIENTIFIC COMMUNICATION (33% of the credits)

› Prepare for future scientific work through a written and oral assignment on scientific topics

› 8h lectures on the methodology for a literature review/ 22h of work in small groups

› Evaluation: Individual literature review + Group oral presentation of a press review

FOOD CHAIN (33% of the credits)

› How are the food chain organized in the European context?

› 17h of lectures on food chain organizations / analysis of some specific food chains

› Evaluation: Individual exam

INTERCULTURAL COMMUNICATION and INTERPERSONAL SKILLS (17% of the credits)

› Get a glimpse at how cultural differences interact in our relationship and communication with others, and how communication between people works…

› 15h + 12h of workshop + 12

› Evaluation: exercises during the workshops + short individual report + participation in the workshops

NOTE: Non French speaking students will also take 15h of French as Foreign Language course

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INTRODUCTION TO FINANCE

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JÉRÉMIE BERTRAND

1-Main objectives

› Understand and master the technical skills to analyze financial statements.

› Learn French accounting standards and how managerial decisions affect financial reports.

› Be able to construct, read and analysis the three most common financial statement: the income statement, balance sheet and cash-flow statement.

› Be able to make a cost accounting analysis.

2-Skills developed

› Be able to understand how firm decisions affect a financial report.

› Be able to analyze firm financial health.

3-General content

1. Generality about accounting
2. The Balance sheet and Income Statement:
    a. How to construct them?
    b. How to analyze them?
3. The Cash-flow statement: construction and analysis
4. Cost accounting analysis: from the raw material to the finished good, how much does it cost?

4- Evaluation

Written exam and a firm financial analysis.

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EXPORT

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 6
TEACHER/COORDINATOR: XAVIER ALIX

1-Main objectives

› To have a comprehensive vision of the different aspects of the export function in a business;

› To be ready to develop an export strategy;

› To be aware of consequences and risks of an export strategy for the business

2-Skills developed

Be able to assure the management of the export function in a food-processing company, an agricultural supplies business, or, more generally, any company that would like to develop an export business.

3-General content

› Diagnosis and strategy (Study and choice of markets, prospecting, organization and sales offer)

› Tools and techniques (transportation of goods, customs, calculation of a sale price export, international sale contract)

› Financing and risk management (reassurance of payments, documentary credit, cover (blanket) of the foreign exchange risk).

4- Evaluation

Individual written work (30%)
Practical study in group (50%)
Oral group presentation of their export project (20%)

5- Program

Session	Duration	Topic / Method
Session 1	4 h	**Lecture**: Introduction; Important Trade milestones; Recent evolution of international Trade; Regional Trade agreements; Why do companies expand overseas? Why is export complex? How to target a market
Session 2	4 h	**Lecture**: Marketing; Marketing research; Marketing planning; Marketing segmentation; Marketing mix; Promotion; Business planning; Some tools (SMART, SWOT, PESTEL); Marketing plan; Case study; Data collection
Session 3	4 h	**Lecture**: Ensure the presence of products on the market; Entry strategies; Various ways to implant in the targeted country (licensing, foreign direct investment, etc.)

Session 4	4 h	**Lecture**: Building commercial policy; Exporting; Product; Exporting cost, pricing and sale; promotion; Countertrade, International contracts
Session 5	4 h	**Lecture**: WTO and regulation of international trade; Dispute settlement; world events and their consequences on business: how to prevent issues and adapt the business
Session 6	4 h	**Lecture**: Transport and logistics; Infrastructures; Terms of Trade = Incoterms, International ocean, air, land and multi-modal transportation; Packaging for export
Session 7	4 h	**Lecture**: International logistics security; Documentation and customs procedures; Custom clearance; Payment; Basic business finance; Finance for international Trade; Terms of payment
Session 8	4 h	**Lecture**: Currency of payment; Managing transaction risks; International commercial documents; International Insurance; Visit and comments of website on main international trade actors (International Chamber of Commerce, etc)
Session 9	4 h	**Lecture**: Using international logistics for competitive advantage; suppliers and support organization; exchange and questions about the full course; Preparation of the week-long project
Week-long project	35 h	**Group work**: the students will be asked to prepare a full project of export of a product overseas, with the description of all steps, from the decision to export to the delivery of the products and their payment, and with costs impact

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DECISION TOOLS: STATISTICS AND MARKET RESEARCH

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: AMAR DJOUAK

1-Main objectives

This unit aims to put knowledge acquired in the field of statistics and marketing at the service of a specified problem. The scope may apply to agriculture, agri-food, environment or landscape fields of study. This approach will enable students to put into practice the acquired knowledge to analyze and solve a given problem.

2-Skills developed

To carry out a quantitative survey, for example in the context of a market study, from planning to statistical analysis and results synthesis.

3-General content

- Quantitative surveys: methodology and tools
- Descriptive and inferential statistics
- Putting into practice acquired notions by carrying out a case study (survey)

4- Evaluation

Oral group exam

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INTRODUCTION TO MARKETING

LEVEL: MASTER 1
PERIOD: SEMESTER 1
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIE CHRISTIAEN

1-Main objectives

To introduce students to strategic issues concerning international marketing, mains steps of the identification of a market, and marketing mix adaptation to an international and multicultural environment.

2-Skills developed

Based on the international environment context:

› To analyze a foreign market and identify opportunities and threats

› To recommend relevant marketing strategy for a company

› To understand, create/adapt a marketing policy to international markets

› To prepare a marketing plan and financial recommendations to be submitted to the management of a company or external financial investors

› To communicate and make a professional business presentation in a multicultural environment

3-General content

› DISCOVER and LEARN | Theoretical approach to international marketing issues: strategic marketing, research marketing and operational marketing, financial decisions

› PRACTISE | Through a case study: multicultural marketing teams work on a product to be launched in a new country; based on a market study, give recommendations regarding marketing strategy, marketing policies and financial decisions.

4- Evaluation

Oral presentation on case study (80%)
Written recommendation to convince external financial investors (20%)

5- Program

Session	Duration	Topic / Method
Session 1 & 2	8h	Lecture – International marketing strategy
Session 3	4h	Lecture – Market study in an international context
Session 4	4h	Lecture – Marketing policies
Session 5	4h	Lecture – Financial issues

Session 6 – 7 – 8	12h	Case study – launch and coaching /Market study, marketing strategy and marketing policies
Session 9	4h	Case study – coaching / financial recommendations
Evaluation session	4h	ORAL PRESENTATION

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PURCHASE AND PROCUREMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: ALAIN MILLECAMPS

1-Main objectives

Buying in the head of purchasing in retail or inside a major food supplier is not the same on a daily basis. This program integrates the different levers, constraints, methods and interactions of the purchasing process.

2-Skills developed

› Manage the "7-step supply" general process.

› Purchasing negotiation skills.

› Common focused practices and key differentiated processes following markets. (Retail, Industries, small companies, importation, distribution channels…)

3-General content

A business case study focused on purchases enable the students to implement a purchasing plan
In detail, the focus is done by different professionals:

› The strategic dimension of the function

› The variables of the function

› The marketing of purchasing and segmentation

› Strategy implementation

› Sourcing methods

› RFI, RFQ, contracts

› Negotiation skills

› Supply chain

› Supplier Relationship management

› Sustainable purchasing

4- Evaluation

Participation: 25%
Presentations: "Purchasing Game": 75%

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DIGITAL BUSINESS

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: MARC-ANTOINE D'HULST

1-Main objectives

› Understand the digital world: changes and issues

› Gain knowledge of how E-commerce and Digital Marketing work (levers and tools)

› Perceive the importance of data, performance indicators and analysis tools

› Understand the evolution of the customer relationship

2-Skills developed

› Analysis of a digital and business strategy (tools, contents, UX Design and datas)

› Master stages of digital business and understand the particular features

› Successfully manage a targeted digital campaign

› Optimize the reference traffic flows and the online sales

3-General content

› **The digital world**
Key figures, consumers behaviour, jobs and vocabulary

› **On-line business**
Trading practices, operating mode, tools and developments

› **Digital Marketing**
Strategies, issues, Inbound & Outbound Marketing, User eXperience (UX) Design, Social Networks and SMO (Social Media Optimization), content management, SEO (Search Engine Optimization) and SEA (Search Engine Advertising)

› **Data**
Data acquisition chain, Key Performance Indicators and reference traffic flows optimization

› **Consumer service**
New expectations, consumer supports and digital content, risks and benefits

4- Evaluation

Online multiple choice or true/false quizzes on best practices
Workshop and oral presentation on a digital strategy for launching an E-commerce website

5- Program

For this program, the objective is to alternate theoretical knowledge and practical highlights

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B-TO-B MARKETING

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: JULIE CHRISTIAEN

PREREQUISITES: Fundamental aspects of marketing – Concepts, methods, tools knowledge

1-Main objectives

To introduce and train students to specific characteristics of BtoB marketing..

2-Skills developed

To be able to figure out how to work through BtoB marketing issues, using relevant tools and methods.

3-General content

› Global view: BtoB marketing specificities

› BtoB Market research

› Strategic BtoB Marketing

› Marketing policies applied to BtoB

4- Evaluation

Individual assessment

5- Program

Learn: Theoretical courses – **Practice**: tutorials – **Discover**: Professional experience presentations

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BUSINESS DEVELOPMENT

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: EN
ECTS: 3
TEACHER/COORDINATOR: ALAIN MILLECAMPS

1-Main objectives

This module aims to provide complementary knowledge that will enable the students to build a business plan. This approach is useful to launch a product range, a new business unit or set up a company.

2-Skills developed

The students will be able to:

› run a structured market survey

› challenge a concept towards a B to C or B to B target with the relevant marketing tools , for instance questionnaires or insights

› build a marketing plan

› design a virtual company structure able to support the activity

› implement the concept through an income statement

› write a business plan

3-General content

› general marketing skills

› advanced marketing skills like market surveys and questionnaires

› commercial skills, forecasts

› general financial skills

› advanced finance concepts like cost per unit, income statement

› technical constraints

› business model and business plan

4- Evaluation

The integration of those concepts is implemented in a business case study, which is the final deliverable.
Project report: 50%
Final presentation: 50%

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SUMMER INTERNSHIP

LEVEL: MASTER 1
PERIOD: SEMESTER 2
LANGUAGE: FR OR EN
ECTS: 6
TEACHER/COORDINATOR: SOPHIE DUPONT WARGNIEZ

All degree-seeking students at ISA Lille must carry out an "assistant engineer internship" (SAI) at the end of the bachelor or Master 1 year.

The main purpose of this internship, lasting for at least eight weeks (forty days), is to provide an immersion in the professional world in a field of the student's choice. This process of discovery helps to guide students in their future development and build career plans. It gives them the technical and interpersonal skills and knowledge of the business world that are essential for any engineer. The SAI enables students to immerse themselves in a company/sector that interests them, or to assist an executive (not necessarily an engineer) occupying a role they themselves would like to fill. The interns are given one or more missions relevant to the curriculum defined by ISA Lille and approved by the host organization.

The knowledge and skills to be acquired/developed through the internship may include:

- Scientific, technical, economic and/or regulatory knowledge about a subject
- Carrying out an analysis or consultancy mission with the appropriate tools
- Collecting and processing information and data and suggesting appropriate solutions
- Reporting information in a relevant way
- Working as part of a team
- Using interpersonal skills, adapting to the workplace and demonstrating professional ethics
- Demonstrating an ability to analyse and summarise
- Demonstrating initiative and independence
- Using creativity, ability to anticipate, imagination and a proactive approach
- The ability to question one's judgement

The internship will be evaluated based on the following:

- The internship mentor's assessment
- Internship report
- Validation interview with a referring teacher

The internship counts for 6 ECTS points (European credits) of the 60 ECTS points awarded for the fourth year of the engineering course (Master 1).

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LEARN MORE AT

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