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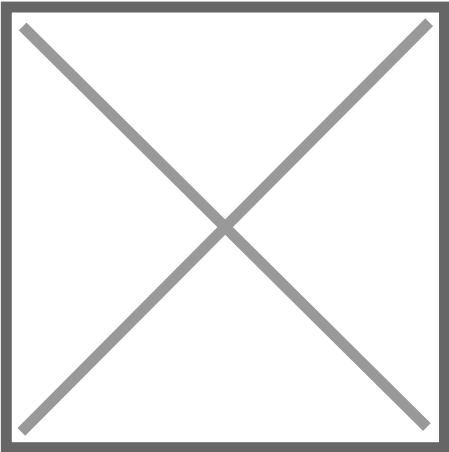
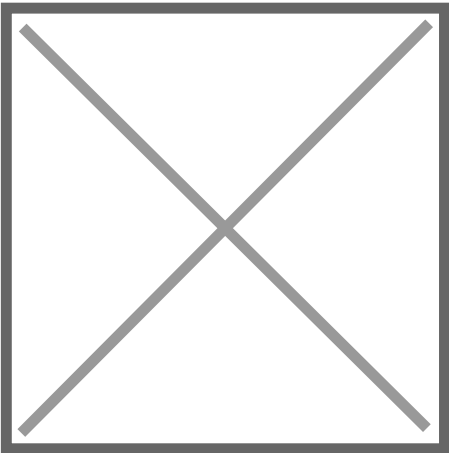
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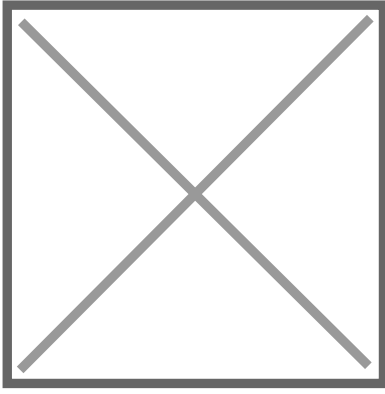
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Add to Compare

M2 FIPDes (Food Innovation and Product Design)





Master's degree

Specialisation Nutrition and Food Science

Enrolment type

Full-time academic programmes

Language(s) of instruction

English

FIPDes is an international 2-year Erasmus Mundus Joint Master in Food Innovation and Product Design.

www.fipdes.eu

To address the challenge of sustainable food production and consumption, FIPDes adopts a cross-disciplinary approach, integrating food science and technology, engineering and entrepreneurship to train international talents developing sustainable, healthy and accessible food solutions for the future generations, at local and global scale.

FIPDes is a two-year interdisciplinary master's degree (M1+M2 both years are mandatory), with compulsory international mobility.

FIPDes is supported by four European universities:

AgroParisTech (France), Technological University Dublin (Ireland), University of Naples Federico II (UNINA, Italy) and Lund University (LU, Sweden).

The first year covers key subjects such as food science and technology, sustainable foods, formulation engineering, marketing and culinary innovation, through courses taught in Paris and Dublin.

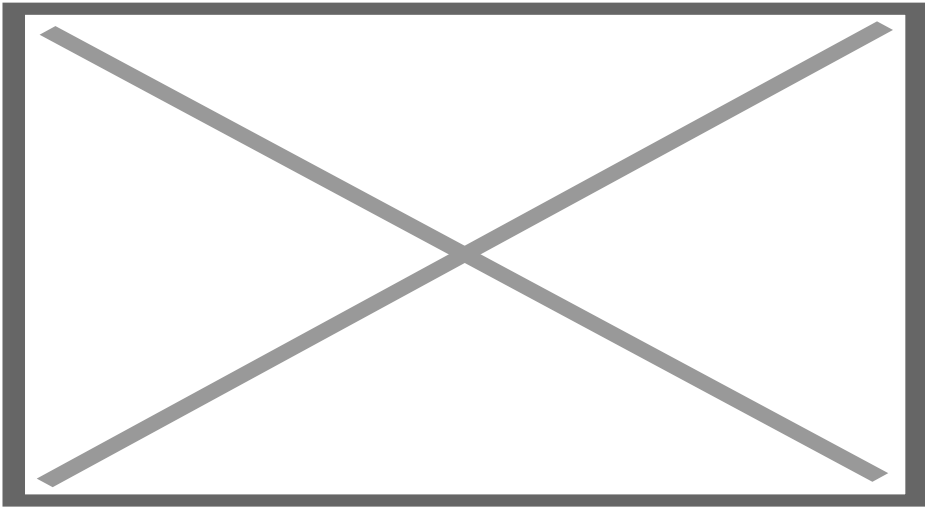
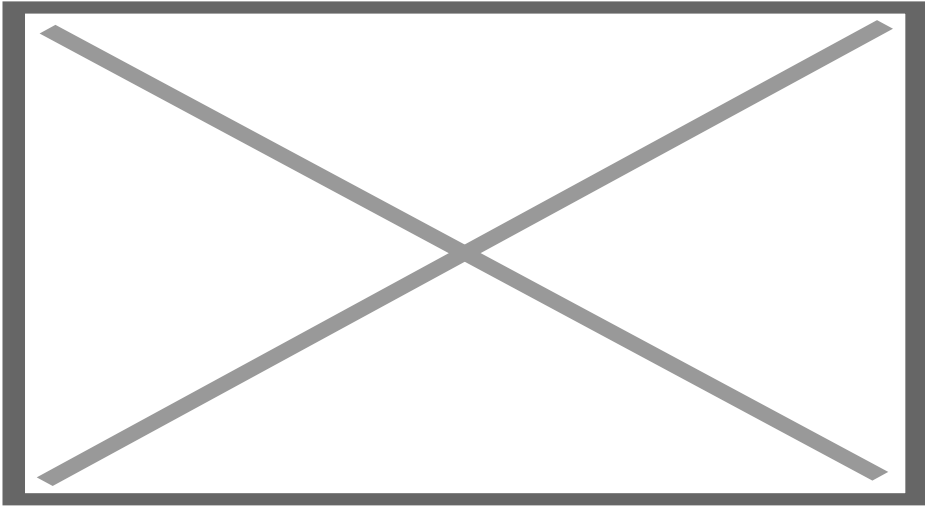
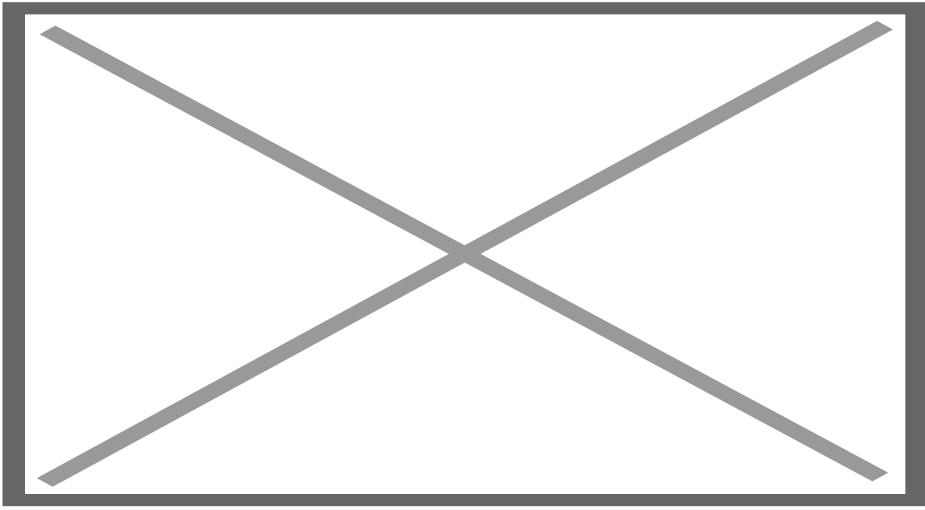
The second year offers three study tracks in key areas of innovation:

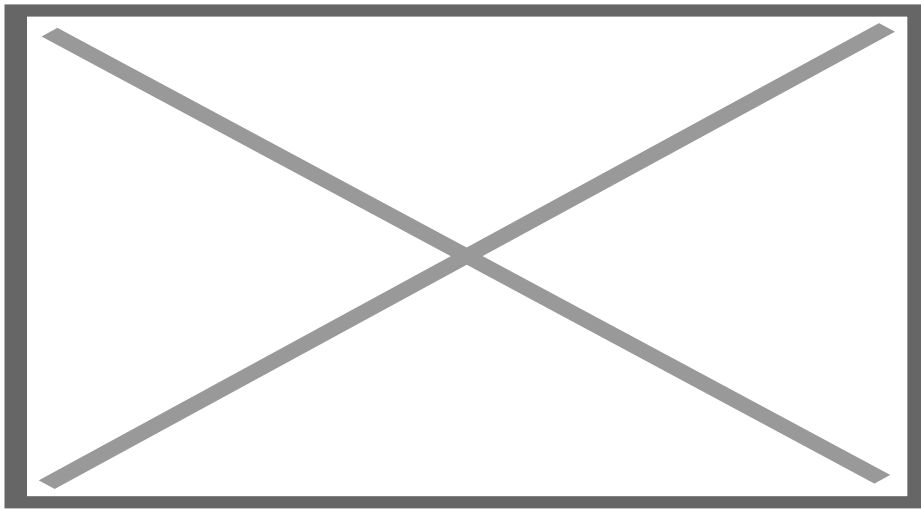
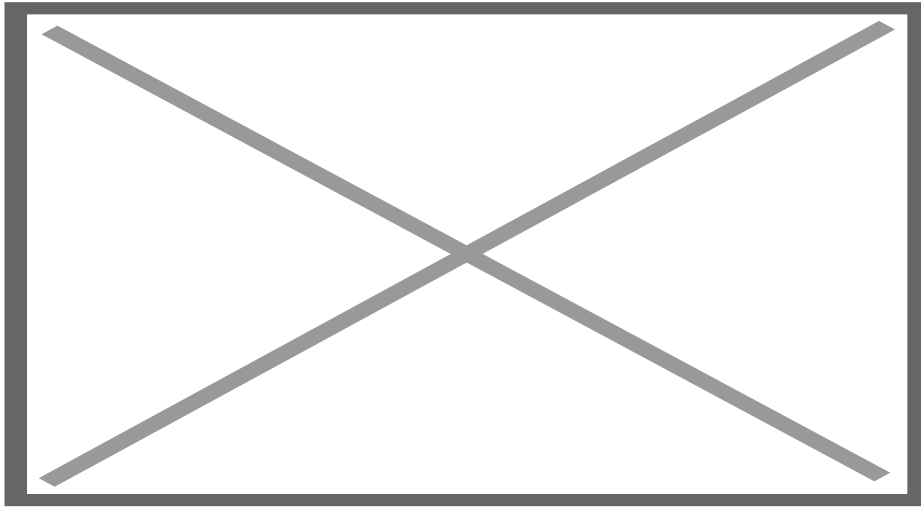
- Food Design & Engineering (AgroParisTech, FR)
- Food Packaging Design & Logistics (LU, SE)
- Healthy Food Design (UNINA, IT)

FIPDes has a dedicated website (www.fipdes.eu) where you can find all the information you need, as well as testimonials on international activities and the careers of former students.

[Télécharger la fiche détaillée](#)

[Apply Now](#)





■ ■

Information

- [Overview](#)
- [Application requirements](#)
- [Schedule](#)

Présentation

Skills

- Integrate and successfully apply knowledge from different disciplines and cultural systems.
- Lead a variety of projects in collaboration with various partners and public and private stakeholders (e.g. international universities, manufacturers, entrepreneurial ecosystems).
- Develop technical skills while exploring creative abilities.
- Strengthen adaptability and entrepreneurial skills.
- Develop an international network of stakeholders in order to be ready to take on new professional challenges at the local and global level.
- Develop highly sought-after soft skills such as team management, leadership and communication in English to different audiences.

Objectives

The Food Design and Engineering track aims to:

- Train students in the scientific, societal and technical challenges of developing sustainable food products in a context of global innovation.
- Develop knowledge and skills in product engineering to evaluate, design and optimise food processes and products with targeted properties and at different scales.
- To develop highly sought-after cross-disciplinary skills in the field of innovation at an international level (intercultural intelligence, innovative project management, scientific communication).

Débouchés

Career prospects

After a Master's or Master's + PhD: researcher or lecturer

After a Master's or Master's + PhD: engineer (research and development, control, production, etc.) in the fields of health, pharmaceuticals, agri-food, biotechnologies, instruments and reagents, cosmetics, pollution control and the environment.

Fields: health, pharmaceuticals, agri-food, biotechnologies, instruments and reagents, cosmetics, pollution control and the environment.

Raw materials and manufacturing quality control manager

After a Master's degree: Research analyst

Ingenieur R&D

Nutritional consulting engineer

Quality assurance manager

Food products application Manager

Sensory analysis manager

R&D Project Manager

Project officer sustainable development

Project Manager

Design engineer industry / public research

CSR Manager / Officer

Public affairs officer in the relevant fields

Project manager in the associative sector, local government

Academic staff

Further Study Opportunities

PhD

Specialised Master's

Admission

Capacity

Available Places

10

Target Audience and Entry Requirements

Have completed 1st year Master's FIPDes

Supporting documents

Compulsory supporting documents

Motivation letter.

All transcripts of the years / semesters validated since the high school diploma at the date of application.

Curriculum Vitae.

Additional supporting documents

Document at your convenience.

VAP file (obligatory for all persons requesting a valuation of the assets to enter the diploma).

Supporting documents :

- Residence permit stating the country of residence of the first country
- Or receipt of request stating the country of first asylum
- Or document from the UNHCR granting refugee status
- Or receipt of refugee status request delivered in France
- Or residence permit stating the refugee status delivered in France
- Or document stating subsidiary protection in France or abroad
- Or document stating temporary protection in France or abroad.

Programme

Food Packaging and Logistics (Lund)

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	discovery
Innovation Engineering	7.5	Semestre 1	20		60				

Innovation Engineering

ECTS : 7.5

Semester: Semestre 1

Detail

Lecture: 20

Practical study : 60

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

The major part of the course is devoted to project work, which allows participants to work in teams to experience a systematic design and innovation process. Class sessions will include a mix of lectures and practical exercises related to methods, tools and strategies for design and innovation. Guest lecturers will provide insight into real industry cases, and teams are provided with coaches that are active researchers within the field of design and innovation. Peer review and feedforward techniques are used throughout the course to ensure critical reflection on both processes and outcomes. The course is a project course based on the challenges related to UN sustainable development goals.

Learning objectives

The purpose of the course is to give participants a deepened understanding of how innovations of both technical and social character are created. The course deals with design and development of both new products (goods and services) and new processes (technological and organizational), with a particular focus on methods, tools and strategies for the early phases of the innovation process. The course is based on a generic design thinking process, and includes lectures and exercises related to theories on design processes and methods within the topic of design and innovation. Through needs-motivated projects guided by coaches, course participants will spend the major part of the course creating conceptual solution proposals and evaluating these with respect to three overlapping criteria: desirability

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis le c
Packaging Material Science	7.5	Semestre 1							

Packaging Material Science

ECTS : 7.5

Semester: Semestre 1

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

- Lectures on different packaging material given by experts on different packaging material • Basic experiments on different packaging materials and their features • Minor projects on different packaging material and their features • Parralell supply chain project to evalutae packaging material features througout supply chains.

Learning objectives

The course is an interdisciplinary course with the aim to provide students with knowledge and practice in features and functions of different packaging materials and the evaluation and testing of them, in a supply chain context.

Special teaching arrangements

Daniel Hellström, John Olsson

Skills

Knowledge and understanding For a passing grade the student must • Understand and explain different features of different packaging materials • Evaluate different features during different stress tests and apply it to deifned supply chains • Perform basic tests of different packaging material and evaluate the consequences in a supply chain.

Competences and skills For a passing grade the student must • Understand and explain the consequences of choosing different packaging material for different products • Independently plan, execute and report on packaging material evaluation projects, and its consequences in

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis le c
Packaging Logistics	7.5	Semestre 1	42	40	28				

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	discovery/practical learning
■									

Packaging Logistics

ECTS : 7.5

Semester: Semestre 1

Detail

Lecture: 42

Practical study : 28

Directed study: 40

Independant learning: 0

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

Packaging logistics is a concept that integrates packaging and logistics in order to improve the efficiency and effectiveness of the supply chain. Packaging logistics uses logistics knowledge about technology and economy along with the properties of packaging in different industrial applications. The course primarily consists of a project where the purpose is to improve an existing packaging system from a packaging logistics perspective. The project is supported by lectures, cases and feedback seminars, where different analyses and syntheses are introduced. Different methods for analysing packaging will also be included as well as the current state and trends in packaging logistics research and practice. Relevance for a sustainable development Packaging and transports are identified as important when a sustainable society is to be developed. The environmental aspects are included in all subjects covered in the course.

Learning objectives

To give students knowledge and deep understandings in how the packaged product influences supply chain performance, i.e. packaging logistics. The aim is also to give students an understanding of packaging system components and the impact of packaging on supply chains. Furthermore, the course provide students with the skill of analysing, designing and choosing packaging system components

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis le c
Packaging Technology and Development	7.5	Semestre 1	40		28				

Subjects	ECTS	Semester	Lecture study	directed practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	discovery practical class
■								

Packaging Technology and Development

ECTS : 7.5

Semester: Semestre 1

Detail

Lecture: 40

Practical study : 28

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

The course is built on project-based learning in which the foremost course component is to implement an industry-assigned packaging development project. The project is carried out in a group and follows a research approach in which theories on packaging development, consumer insights, and sustainable development are converted into practical application in the project. You will receive feedback during the project from your supervisor and from seminars. Support in the project is provided through lectures and study visits with researchers from the Department and representatives from industry. The lectures present theory on the development of packaging systems for various applications, on different packing materials, on market and consumer aspects, as well as aspects of sustainable development of packaging. Guest lectures and study visits provide good insights into how different companies work with packaging development and production.

Learning objectives

The course provides theoretical and practical knowledge in packaging development and innovation, and deals with the significance of packaging in society. Upon course completion, you will understand how to run a packaging development project with others, and how packaging affects sustainable development in society. You will also have the experience of practical project work with a relevant industry.

Healthy Food Design (UNINA)

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
Chemical Reactions and Food Quality Design	6	Semestre 1	38		10				

Chemical Reactions and Food Quality Design

ECTS : 6

Semester: Semestre 1

Detail

Lecture: 38

Practical study : 10

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

• Chemical reactions in foods and impact on safety and sensory aspects (Browning reactions, Maillard reaction, Lipid oxidation, Interplay between Maillard reaction and lipid oxidation, Emulsion stability, Proteolysis, Oxidation Peroxidation, Reduction, Enzyme treatments, Formation of volatiles molecules; modification of texture; Color formation; loss of nutritive value, dicarbonyls loading, thermal induced toxicants formation, chemical modifications and safety in gluten-free and lactose-free products) • Analytical techniques to evaluate food quality • Proteomics, lipidomics and metabolomics applied to healthy food characterization • Antioxidant Capacity of foods • Modelling food quality • Sensory molecules upon food processing: tastants and volatiles • Allergens: legislation, labels and chemical analysis • EU directive “Novel food”

Learning objectives

To acquire the knowledge, understanding and ability to control the chemical reactions occurring during food manufacturing and impacting food quality.

Skills

To identify the appropriate markers, techniques and methodologies for the quality control and the safety validation of novel foods/ingredients and processes

• Knowledge and understanding of : 1) the

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
Microbiology Applied to Healthy Food Design	6	Semestre 1	23		25				

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
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Microbiology Applied to Healthy Food Design

ECTS : 6

Semester: Semestre 1

Detail

Lecture: 23

Practical study : 25

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

Overview of lactic acid bacteria. Microbiology of probiotics. Microbiological safety in food industry. Technological aspects of fermented foods. Novel foods. Techniques in food microbiology. Legislation aspects.

Learning objectives

To give the adequate knowledge and skills in the field of fermented foods from the point of view of microbiological involvements

Skills

To monitor microbial population during food processing by using conventional and molecular techniques. To select microorganisms for healthy food development. To implement HACCP principles to a food process. To learn main characteristics of microorganisms involved in food fermentation. To understand the role of microorganisms in the chemical and physical modifications during food fermentation. To learn the main characteristics of probiotics. To understand the interaction between probiotics and human gut. To learn basic concept of food safety. To perform a microbiological analysis of a food samples both by using conventional and molecular techniques. To monitor microbial population during food processing. To select microorganisms for healthy benefits to human body. To implement HACCP principles to a food process.

Type of assessment

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
Mediterranean Diet Products and Ingredients	6	Semestre 1	24	12	24				

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
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Mediterranean Diet Products and Ingredients

ECTS : 6

Semester: Semestre 1

Detail

Lecture: 24

Practical study : 24

Directed study: 12

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes Basic knowledges on food chemistry and technology

Programme/contents

History of culinary Italian traditions from end of '700 to now. The born of gastronomy and its evolution in the different Mediterranean regions. Mediterranean traditions and gastronomy practices: molecular events underpinning sensory and health effects of Mediterranean dishes. Typical processes and food pairs of Mediterranean gastronomy: Marinade with lemon and vinegar, Frying in Virgin Olive oil, Earthenware (terracotta) cooking of tomato sauce. Mozzarella cheese manufacturing. Olive oil manufacturing. Pizza manufacturing. Vinification and wine sensory analysis.

Learning objectives

To provide the anthropological and cultural background behind the common relationship between food and culture that can be found in all countries of Mediterranean sea. To acquire basic knowledge of the Italian culinary culture and traditional food processing.

Skills

Knowledge of the Mediterranean culinary culture and gastronomy. Understanding of the molecular events underpinning the sensory and health effects of the Mediterranean recipes.

Type of assessment

Evaluation Continue non Intégrale

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
Senior Project: Design and Development of Healthy Foods	6	Semestre 1	8	8	24				

Senior Project: Design and Development of Healthy Foods

ECTS : 6

Semester: Semestre 1

Detail

Lecture: 8

Practical study : 24

Directed study: 8

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

Students are in charge of developing an individual project concerning a innovation in food development or research. In particular, students design a new food or a new research on a specific topic starting from the state of the art to the selection of procedures and expected results definition.

Learning objectives

To deepen and apply the skills and knowledge acquired during the first year courses.

Skills

To integrate the theoretical and practical skills of product development; to demonstrate a critical awareness of the industrial R&D problems associated with new food design and product development/validation.

- Knowledge and understanding of the background related to a specific topic in food design and nutrition field.
- Skills: To integrate the theoretical and practical skills of product development; to demonstrate a critical awareness of the industrial R&D problems associated with new food design and product development/validation.

Type of assessment

Evaluation Continue non Intégrale

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
Nutrition Applied to Healthy Food Design	6	Semestre 1	48	10	10				

Nutrition Applied to Healthy Food Design

ECTS : 6

Semester: Semestre 1

Detail

Lecture: 48

Practical study : 10

Directed study: 10

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

- Physiology of human gastro-intestinal tract, brain and gustatory system.
- Design of healthy foods: the step by step approach.
- Personalized nutrition and target population in food design.
- Nutrient metabolism, bioavailability and functionality in health and disease condition.
- Nutrient sensing and design of healthy foods
- Gut microbiota: composition, role in nutrient metabolism, interaction with diet and host health.
- Design of healthy foods by targeting gut microbiota.
- Body weight control: food intake and energy expenditure. Physiological and psychological mechanisms behind appetite and food choice. Food factors modulating satiety.
- Foods/ingredients modulating appetite control and energy expenditure: the market and EFSA opinions.
- European legislation on nutritional and health claims. Methodologies for validation of efficacy of functional foods/ingredients.
- Biomarkers of non-communicable chronic diseases, oxidative stress, inflammation, hunger and satiety.

Learning objectives

- To provide advanced knowledge on physiological systems, nutrient metabolism and European legislation on nutritional and health claims
- To provide skills to design healthy foods tailored on specific categories of consumers and to validate their efficacy

Master thesis Food Packaging and Logistics (Lund)

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	distance learning courses
Master Thesis Lund	30	Semestre 2							

Master Thesis Lund

ECTS : 30

Semester: Semestre 2

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

The degree project is an independent project.

It is to be executed individually or in pairs.

The degree project is to include the following assessed components: • a

document describing the goals of the degree

project • a written report in Swedish or

English with a summary in English • a

separate summary which is aimed at a

popular science readership • oral

presentation of the degree project at a public

seminar at the Faculty of Engineering • an

oral and written critical review of another

student's degree project at a public seminar

where it is presented. The document

describing the goals of the degree project is

to be written at an early stage and must be

approved by all supervisors and the

examiner. It is to include a description of the

problem to solve, the disciplinary foundation

and proven experience on which the project

is to be based, the main sources of

information, and the project's expected

contribution to the advancement of

knowledge. The document is also to include

a general description of the approach, choice

of method, resource requirements and time

needed. The contents of the document are to

be gradually integrated in the written report.

The written report is to describe the degree

project and its findings. If two students have

collaborated on the project, the contribution

of each student must be clearly discernible.

The popular science summary is to be

written in accordance with the general LTH

guidelines. The written report is to be made

available in a form suitable for review at

least one week before the seminar, which is

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	distance learning courses
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[Master Thesis UNINA](#)

30

Semestre 2

Master Thesis UNINA

ECTS : 30

Semester: Semestre 2

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

The contents may change according with the available projects and the research fields of the supervisors.

Learning objectives

The experimental thesis aims at giving students lab working, data analysis and critical skills in a specific research area in the field of food innovation and health.

Skills

- knowledge of safety issues in research laboratory;
- knowledge of many research methodologies and experimental approach for problem solving;
- lab working and analytical skills
- skills on dissemination of research findings

Type of assessment

Evaluation Continue non Intégrale

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	distance learning courses
----------	------	----------	---------	----------------	-----------------	------------------------	-------------------------	--------------------------------	---------------------------

Professional
development
and career
plan

0

Semestre
1

6.5



Professional development and career plan

ECTS : 0

Semester: Semestre 1

Detail

Directed study: 6.5

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

Rules are provided for the functioning of the workshop: kindness in the relationships and discretion.

Information is given about the differences between the good self-presentation's norms in a recruitment setting according to the nationality of the recruiter. The French good self-presentation norms are specified.

Each student trains to speak about himself (herself), to answer interview questions and to write a CV and a covering letter according to these norms. The self-presentations are enriched by the feedbacks and reflections of the other participants.

Information is given about the difficulties, misunderstandings as well as positive occurrences which may appear when living and studying in a foreign country in order to favour reflections and thoughts about these issues.

Learning objectives

To help the students figure out which job or complementary education will match their interests, motivations, personal characteristics, skills, knowledge, choice of place to live and eventually their career planning once they graduate.

To give them some clues for internship or job seeking and to train them to communicate in a French recruitment setting.

To propose to them the necessary insights about the functioning of the workshop in its specific setting to help them develop collaborative skills and thus make the workshop productive and useful for each participant.

To explain how linguistic, cultural and personal

Senior
Project:
Scaling-up
and
Sustainability
Assessment

6

Semestre
1 9

9

18



Senior Project: Scaling-up and Sustainability Assessment

ECTS : 6

Semester: Semestre 1

Detail

Lecture: 9

Practical study : 18

Directed study: 9

Tutored project 9

Project : 36

Independant learning: 9

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

Project work at the experimental kitchen and pilot scale.

- Creativity and brainstorming sessions
- Selected lectures and tutorials on specific topics (i.e. scale-up; food & flavour formulation, food control, food process design);
- Multidisciplinary tutoring;
- Subjects will include both "theoretical" and practical part (lab., kitchen, pilot and semi-pilot scale).

Learning objectives

Make students reflect on the new issues generated by the scale change when passing from a “kitchen prototype” to the industrial scale.

Plan, carry out and evaluate a scale-up process on concrete cases issued from the TU Dublin food prototype showcase.

Put the students into a project management situation working on a practical case.

Allow the students to develop and improve capacities in terms of project management and team work, in particular in the context of research and innovative project.

Overall organisation

Tutorials, workshops in experimental kitchen, experimental work in the technological hall, project work in teams

Food
Chemistry :
from
Research to
Sustainable
Food Design
and
Development

4

Semestre
1 9

9

24



Food Chemistry : from Research to Sustainable Food Design and Development

ECTS : 4

Semester: Semestre 1

Detail

Lecture: 9

Practical study : 24

Directed study: 9

Independant learning: 6

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

B2 English Level.

- Basic knowledge of food science and process engineering
- Completed M1 FIPDes

Programme/contents

The module deals with food reactivity applied to food quality design (nutritional, safety, sensorial and technological dimensions). It is set-up with some lectures and a research-based lab-work.

The following items will be covered: Reactivity of processed food: main reaction pathways, role of ingredients, key precursors and process parameters; Exploring the relationships between chemical composition, reactivity and quality; Exploring the relationships between product formulation and processing; Methods of experimental design ; practice of experimental techniques linked to the measurement of specific properties or molecular markers (e.g. antioxidant power, flavour analysis, chemical composition, oxygen diffusion, spectrophotometric and chromatographic techniques, etc.).

Learning objectives

- Understand the scientific and technical issues related to the field of food chemistry and reaction engineering in food matrices (context, research issue, industrial issue, economic issue, etc.).
- Measure and understand chemical reactions and their dynamics in processed food products (real or model ones).
- Orientate the reactivity and functionality of chemical constituents to tailor food properties

[French](#)
[Language or](#)
[Foreign](#)
[Language for](#) 2 Semestre
 1 36
[French](#)
[Speaking](#)
[Students](#)
 ■

French Language or Foreign Language for French Speaking Students

ECTS : 2

Semester: Semestre 1

Detail

Directed study: 36

Independant learning: 9

Language(s) of instruction

Français

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

French life, French integration, mentality, first aid kit, culture, company culture, CVs, cover letter, job interview....

Activate, consolidate and expand their knowledge, develop autonomy and fluency in the language, a level of autonomy (B1 / B1 + CEFR / European Framework) or operability (B2 / B2 +) to make courses or studies in Francophone countries if the student wishes.

Cultures, civilization and news offer extensive range of options to make them alive and interactive courses.

Type of assessment

Evaluation Continue non Intégrale

[Molecular](#)
[and Physical](#) 3 Semestre
[Gastronomy](#) 1 6 9



Molecular and Physical Gastronomy

ECTS : 3

Semester: Semestre 1

Detail

Lecture: 6

Directed study: 9

Tutored project 12

Independant learning: 9

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

As this course's content corresponds to “Molecular Gastronomy for innovation”, it has to include informations+concepts+methods+values+anecdotes on the various items:

1. Cooking: its social link, art, technique components
Discovering cuisine: what it is, cultural aspects, history, particular regional developments, ways of doing, organization, relationship with the food industry
 - 1.2. Social link: how it is achieved, how it could be improved, what “eating” means
 - 1.3. The art component of cuisine: what is art, what is culinary art, how artists work, their goals and methods
 - 1.4. The technical component of cuisine
 - 1.4.1. First order descriptions of culinary processes (chemical, physical), based on the use of the “formalism for disperse systems” (DSF)
 - 1.4.2. Green chemistry and cuisine: the extent of chemical modifications during culinary processes and their importance for regulation
 - 1.4.3. The issue of potential vs. actual bioactivity (including bioavailability, bioaccessibility, matrix effects)
2. Traditional cuisine:
 - 2.1. Culinary definitions
 - 2.2. Culinary precisions: a key for innovation

Physical
Chemistry
for the
Structuration
of Food
Products

4

Semestre
1

11

6

7



Physical Chemistry for the Structuration of Food Products

ECTS : 4

Semester: Semestre 1

Detail

Lecture: 11

Practical study : 7

Directed study: 6

Tutored project 24

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

This module is shared with French local students of the IPP study track. The courses are in English.

The course deal with physical chemistry applied to food structure design. There is a mix of tutoring, guest lectures, bibliographic study cases and tests of the acquired knowledge.

Learning objectives

This course aims to demonstrate how formulation and processes lead to the creation of product structures and the underlying physicochemical mechanisms. It also provides an opportunity to explore tools for studying and controlling the resulting structures: observations at different scales, indirect analyses, modelling, and simulation.

Upon completion of this course, students will have acquired knowledge of the following systems and their applications:

- thickened solutions and gels
- emulsions
- foams
- suspensions of solid particles
- amorphous, crystalline, and powdered solid states
- agglomeration phenomena.

For each case, the course covers the theoretical foundations of the mechanisms involved, applications, process aspects related to the

[Bibliographic
review](#) 5

Semestre
1

6



Bibliographic review

ECTS : 5

Semester: Semestre 1

Detail

Directed study: 6

Tutored project 9

Independent learning: 45

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

- Exploration of the topic
- Bibliographic research
- Scientific writing
- Oral presentation
- Regular follow-up activities

Learning objectives

- Reformulate a research question based on a clear research brief
- Carry out a bibliographic research
- Apply the most relevant bibliographic search tools
- Develop a critical analysis on the methodology and the content of the study
- Write an original scientific overview

Overall organisation

Tutorial

Tutored project

Special teaching arrangements

The student must demonstrate an ability to evaluate his or her own project and those of others in terms of relevant scientific and deontological aspects.

The work is to be carried out individually. The

Stage/Master thesis Food Design and Engineering (AgroParisTech)

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	c
Master Thesis AgroParisTech	30	Semestre 2		18					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	other
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Master Thesis AgroParisTech

ECTS : 30

Semester: Semestre 2

Detail

Directed study: 18

Tutored project 12

Independant learning: 10

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

The Msc. Thesis is the final module of the Erasmus Mundus Joint Master in Food Innovation and Product Design (FIPDes). Based on a 5 to 6 months internship, it includes the following items:

- Running and interpretation of an original experimental and scientific work
- Development and mastery of the project within a given research framework
- Writing a Msc. Thesis report
- Presentation and dissemination of results

Learning objectives

The aim of the thesis project is for the student to develop and demonstrate the knowledge and skills required to work independently and be able to critical reasoning, reflection, analysis and discussion.

Overall organisation

- Tutored project
- Experimental work carried out in a hosting laboratory of the FIPDes network

Special teaching arrangements

Values and attitudes

For a passing grade on the thesis project the

Food Design and Engineering (AgroParisTech) -modules à choix

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dista learn cou
Product Process Interaction	4	Semestre 1	24		24				

Product Process Interaction

ECTS : 4

Semester: Semestre 1

Detail

Lecture: 24

Practical study : 24

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Programme/contents

Integrated analysis of the effects of formulation and processing methods on the functional properties of food, in relation to composition, operating conditions, and transport phenomena.

1. The course will present unit operations such as spray drying, freeze-drying, emulsification, high-pressure processing, and other thermomechanical texturizing processes. These will be approached through an understanding of the physical and chemical principles governing food structure and the relationship between formulation, process operating conditions, and product functional properties. Selected examples will be presented, drawing on the research experience of the lecturers, to illustrate concrete and innovative applications in the food industry.
2. The methodologies covered will include dimensional analysis to account for scaling changes, as well as the study of transport phenomena, enabling the prediction of the effects of processes on food products. These approaches will also be illustrated with examples from the instructors' experience, incorporating real-world cases and innovative applications in the food industry.
3. Students will apply the concepts studied to practical cases thus becoming active participants in their own learning. This

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dista learn cou
Free module	2	Semestre 1							
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Free module

ECTS : 2

Semester: Semestre 1

Language(s) of instruction

Anglais

Remote teaching

non

Programme/contents

One module to choose among a list.

Type of assessment

Détail renseigné au niveau Élément Constitutif

[Modelling](#)

[Food](#)

[Process](#)

[and](#)

[Properties](#)

4	Semestre 1	33
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Modelling Food Process and Properties

ECTS : 4

Semester: Semestre 1

Detail

Directed study: 33

Tutored project 12

Independant learning: 3

Language(s) of instruction

Anglais

Remote teaching

non

Prerequisites

Completed M1 FIPDes

Fundamentals in process engineering (writing mass and energy balances) and in materials processing technologies (heat treatment, separation)

Basic knowledge of Python coding

Basic knowledge of chemical or biochemical kinetics

Programme/contents

Review of Modelling and Python

- Review of Mass/Energy Balances
- Basic Python structures, useful libraries (numerical, plotting)

Regression and Parameter Estimation

- Fitting Simple Models from Experimental Data
- Goodness-of-Fit Criteria

Modelling Reactions and Transformation Phenomena

- ODE Systems, Numerical Solution
- Parameter Identification in ODEs

Modelling Unit Operations

- Coupled Mass/Energy Balances
- Consideration of Product Quality and/or Total Annual Cost

Teaching Location(s)

PALAISEAU

Academic Partner(s)

TU Dublin, Ireland; Lund University, Sweden and UNINA, Italy

Contact

- **Barbara REGA**
Responsable de formation
- **Secretary FIPDes**
Secrétariat
- **Moussa MARWEN**
Responsable de formation

Links

[More information on tuition fees](#)

[More information on scholarships](#)

<http://www.universite-paris-saclay.fr/formation/master/nutrition-et-sciences-des-aliments/m2-fipdes-food-innovation-and-product-design>