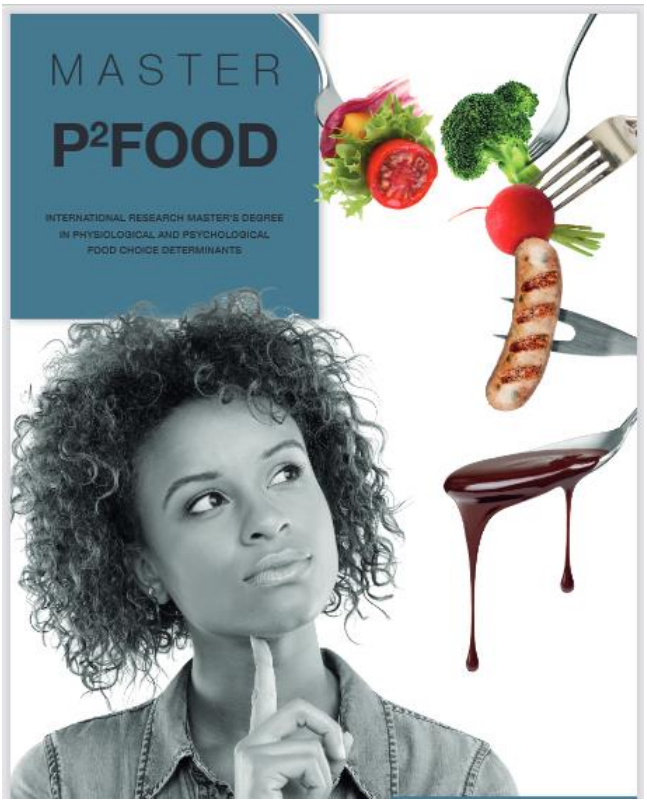

SYLLABUS MASTER P² FOOD

2021-22

AGRO SUP DIJON

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BOURGOGNE FRANCHE-COMTÉ

Professional skills acquired through this training

- Design studies aimed at understanding the eating behavior of healthy people, throughout their life, in given contexts and in situations of social interactions,
- Set up studies to assess the effectiveness of an intervention aimed at modulating eating behaviors to make them healthier and more sustainable
- Analyze data from qualitative and quantitative studies, interpret into clear conclusions and operational recommendations
- Collect and analyze relevant information (scientific information, public policies, flow of circulating information (social networks, press), etc …), to identify opportunities for innovation or research
- Explain, argue and defend, in written and spoken English, adjusting the content of the presentation to the audience

Overview of the program of the 1st year

Courses In 1st year will focus on 4 fields, represented by colors in this syllabus:

Transferable skills and development of a career plan

Food science

Physiology

Humanities and social sciences

1st year, 1st semester (September - December) (30 CREDITS)	Unit 1: Toolbox (6 CREDITS)
	Unit 2: Chemosenses, emotions, Memory and food choices (introduction course "CHEM1", 3 CREDITS)
	Unit 6B: Chemosenses, emotions, Memory and food choices (in-depth course "CHEM2", 3 CREDITS)
	Unit 3: Sensory Evaluation (3 CREDITS)
	Unit 4: Introduction to Microbiology and microbiological processes (3 CREDITS)
	Unit 5: Introduction to Food chemistry physico-chemistry (3 CREDITS)
	Unit 7B: Psycho1 (4 CREDITS)
	Unit 8B: informatic's and statistical tools (4 CREDITS)

1st year, 2nd semester (January - June) (30 CREDITS)	Unit 9: Nutrition (3 CREDITS)
	Unit 10: Information on health and sustainability properties of foods, and consumer behavior (3 CREDITS)
	Unit 11B: psycho2 (3 CREDITS)
	Unit 12B: Physiology of perception (3 CREDITS)
	Unit 13B: Physiological regulation of eating behavior (6 Credits)
	Unit 14B : Professionnalisation (6 CREDITS)

	Unit 15B : 2 months Internship (6 CREDITS)

Units of 1st semester

Unit 1 : Toolbox (6 credits)	
Unit supervisor: **Camille Loupiac**	
Lecturers: Ray Horn, Thierry Tran, Carmela Chateau, Laurent Beney, Loïc Briand, Marthe Jewel, Gaëlle Arvisenet, Stéphane Guyot Lecturers from the center of Languages and communication	Lectures: 60h Tutorials: Practicals: -

Objectives:

This unit will allow the students to become more familiar with the university studies in France and the field of studies.

Students will discover the local scientific landscape. They will improve their skills in communication and discover the rules of scientific communication.

Content:

• Language courses (French or English):

• Communication:

- Discovering the mechanisms of oral expression.
  Controlling speech and discourse coherence.
  Achieving systematic harmonious oral practice.
  Becoming familiar with talks and confrontations.
- Learning to steer a debate, facilitate a meeting, express an opinion and participate in a conversation…
- Practical exercises with situations and case analysis

• Tools: students will learn how to read a scientific paper, how to search publications related to a specific topic, to use a reference manager application.

• Towards a better definition of your career prospects:

- Presentation of two research institutes (Joint Research Units PAM and CSGA) and an innovation cluster (VITAGORA)

Assessment:

- Test to evaluate the level of language (French or English)
- Abstract of scientific papers, with proper indexing of sources

Courses of this Unit are shared with the students of the major "MP2"

Unit 2: Chemosenses, Emotions, Memory and Food Choice, *Introduction course "CHEM1"* (3 credits)	
Unit supervisor: **Frédérique Datiche**	
Lecturers : Frédérique Datiche	Lectures: 20h Tutorials: 2h Practicals: 3h

Objectives:

The aim of this course is to present to the students various factors known to influence the process of food choice, translating the acceptance or the rejection of a food. The eating habits, even if motivated by internal needs for energy order, stays a voluntary behavior based on the consumer's decision. Whatever his internal state, the consumer keeps the power to consume or not to consume certain food. Multiple factors are involved in this decision since feeding behavior involves 2 systems, a homeostatic and a hedonic one. Thus, we will pay attention to: the learning and memory processes, the emotional dimension of eating, the food palatability and reward.

Organization :

Themes of the lectures: (F Datiche)
-Neurosciences basics: human brain anatomy
-Neuroanatomical and functional basis of memory
-Role of learning & memory processes in feeding behavior
-Brain and reward circuit
-Neuroanatomical substrate of emotions

Theme of the tutorial : physiology of food intake (N Khan)

Theme of the Practical: (F Datiche)
Brain neuroanatomy : illustration of regions involved in memory, emotions, reward and food intake

Assessment :

- Ongoing assessment: a short written exam will be organized to test the knowledge acquired during the Practical session
- Final assessment: A written exam will be organized in December to test the knowledge acquired during the lectures

Courses of this Unit are shared with the students of the major “MP2”

Unit 6B: Chemosenses, Emotions, Memory and Food Choice, *in-depth Course "CHEM2"* (3 credits)

Unit supervisor: **Frédérique Datiche**

Lecturers : Naïm Khan
Frédérique Datiche

Lectures: -
Tutorials: 12h
Practicals: 12h
Project: No

Objectives:

Even if the biological basis remains to be elucidated, it is well-know that interactions exist between stress and food intake. Stress has been suggested as one environmental factor that may contribute to the development of maladaptive food choices and obesity. Of particular importance is the effect of chronic psychosocial stress on dietary preferences and food consumption. As an example, the rewarding properties of sweet palatable foods confer stress relief. Stressors impact energy balance and affective state in a manner that depends on a multitude of factors, including genetic, sex-dependent, psycho social, nutritional, metabolic, and experience-dependent elements. The aim of this teaching unit is to show the complexity of physiological and behavioral interactions that link stress, food intake and emotional state.

Organization :

*Some tutorial sessions will deal with :
-the type of stressors, acute vs chronic stress
-the Stress-induced activation of the neuroendocrine hypothalamic-pituitary-adrenal (HPA) axis and glucocorticoid synthesis
- the impact of stress on food intake (hyperphagia or anorexia)
*Some tutorial sessions will consist of analysis of scientific articles by students and oral presentation

* The practical session will consist of a group work. The aim will be to learn how to formulate a research hypothesis and how to design the experimental design, focusing on stress, feeding behavior and/or odors

Assessment :

Ongoing assessment:

- Individual oral presentations of scientific articles will be assessed.
- The Group work will be assessed via a short written report and an oral presentation

Final assessment: A written exam will be organized in December to test the knowledge acquired during the lectures

Unit 3: Sensory evaluation (3 credits)

Unit supervisor: Gaëlle Arvisenet

Lecturers :
Hélène Labouré and Gaëlle Arvisenet

Lectures: 6h
Tutorials: -
Practicals: 18h
Project: No

This course will provide students with an introduction to sensory evaluation applied to product development. The lectures will cover the methodologies used to characterize food sensory properties and evaluate consumers' food appreciation. During practical ssessions, students will apply those methodologies currently used in food development.

- **Sensory demo** (perception, cross modal effects, expectation effects, context effects…)
- **What is sensory evaluation** and why using it in sensory evaluation?
- **Consumer tests:** Ranking, numerical and semantic scales, JAR scales; Application: data analysis & interpretation, report writing
- **Discrimination tests:** triangle test, 2AFC, Tetrad, inferential statistics and binomial distribution; Application: Preparation of a test, data collection, data analysis & interpretation, report writing
- **Descriptive tests**: Principle of Quantitative Descriptive analysis QDA + limits of QDA and necessity of alternative methods), Application: Vocabulary generation, interpretation of data
- **New descriptive methods**: CATA, Flash Profile, Projective mapping; Application: Reading of a scientific article in groups, report-back session: Which test, for which objective, and which type of data?
- **Linking sensory properties and consumer appreciation**: Penalty analysis; Application of penalty analysis

Expected learning outcomes: Learning objectives for this course include 1) acquiring an understanding of sensory evaluation methodologies and their application to food development; 2) identify the components of a good sensory tests protocol, understanding the importance of a properly writing of protocols 3) interpret the results of sensory tests and their implications for food development

Assessment:

- Ongoing assessment: reports and oral presentation (ongoing assessment)
- A final exam: multiple choice or short answer questions covering all material presented during the lectures and labs.

Courses of this Unit are shared with the students of the major MP2

Unit 4: Introduction to Microbiology and microbiological processes (3 credits)

Unit supervisor: Stéphane Guyot

Lecturers:	Lectures: 16h
Stéphane Guyot	Tutorials: 4h
Stéphanie Desroche-Weidmann	Practicals: -
Gaël Belliot	Project: No

Content of the Unit:

The aim of this teaching Unit is to provide basics knowledge in biology and more particularly in microbiology, parasitology and virology in the context of food design. One the one hand, microorganisms are widely used in the field of food technology to transform raw matter by the means of fermentation for instance, produce aroma compounds or other compounds of interest. On the other hand, fight against undesired microorganisms and parasites is essential to avoid the presence of pathogens (as *Listeria monocytogenes* and *Salmonella* for pathogen bacteria and Cryptosporidium for parasites) or alteration flora in food matrix. Moreover, non-living entities also called viruses, as Norovirus and Rotavirus, can contaminate food matrix and must be destroyed before the consumption step.

Lectures:

- Basics in cell biology: living tree, classification and structure of bacteria, fungi and parasites and their behavior in the context of food production (some examples) (4 h)
- Virology: definition / structure / classification of viruses. Collective poisoning related to viruses. Ways of food contamination by viruses. (4 h)
- Nutrional requirements of microorganisms, Microbial metabolism, Fermentation : ex dairy products (4 h)
- Impact of microorganisms on food quality (4 h)

Tutorials:

- Growth parameters of microorganisms (2 h)
- Document analysis on fermentation flora (2 h)

Expected learning outcomes

Basics in the cell biology and more specifically in microbiology and in virology in the context of food sciences.
Ability to retrieve information, analyze it, and transcribe it orally and in reports.

Assessment

Ongoing assessment: oral presentation and short exam (oral or written)
Final assessment: multiple choice or short answer questions covering all material presented during the lectures and tutorials

Courses of this Unit are shared with the students of the major MP2

Unit 5: Introduction to Food chemistry physico-chemistry (3 credits)

Unit supervisor: **Camille Loupiac**

Lecturers :
Camille Loupiac

Lectures: 12h
Tutorials: 12h
Practicals : -
Project : Yes

Program:

Lectures :

Food components: structure and analysis; Proteins (2h); Polysaccharides (2h); Lipids (2h); Antioxydants (2h); Vitamins (2h); Minerals (2h)

Tutorials:

Food components and analysis with cases studies: International foods (students choice) and formulated products (super food proteins powder, meat, milk, hemp protein dessert, jam, candies, chocolates, yoghurt, …) 8h

Debriefing of the cases studies: 4h

Expected learning outcomes:

Basic knowledge in biochemistry, analytical chemistry applied to food components

Understanding what are the main and minor food components by reading the packaging

To be able to find how to carry out the analysis of these components

Assessment

Ongoing assessment: practical report/ exercice on food composition
Final assessment: Exam on food composition and analysis

Courses of this Unit are shared with the students of the major MP2

Unit 7B: Psycho1 (4 credits)

Unit supervisor: Matthieu Duboys Delabarre

Lecturers :
Matthieu Duboys Delabarre, Renaud Brochard

Lectures: 20h
Tutorials: 12
Practicals:
Project : Yes

This Unit will be composed of two parts:

❖ Psychophysics
- Principle of perception *(gestalt theory)*
- How to measure and model perception

❖ Sociology

This part of the course aims to explore the sociological dimension of food facts. Its objective is to make students understand that food activity, beyond its biological and psychological dimensions, is also based on collective logic.

This module

1- Introduction
   a. Food and eating an object of sociology
   b. The human food system
2- The eternal eater: an anthropological point of view
   a. Rules and structure
   b. Incorporation and symbolic significance
3- Theorizing the food system
   a. The functionalist approach
   b. The structuralist approach
   c. The developmental approach
4- The modern food system
   a. Contrasting traditional and modern food system
   b. Two way of thinking the rationalization of food system
      i. A McDonaldization process?
      ii. Rationalization and modern view of diet and health
   c. The "gastroanomie" theory
   d. Risk and scare: the question of confidence
   e. Delocalisation and relocalisation: eater's food reflexivity

Assessment:

Ongoing assessment: the part about sociology will be evaluated through an oral presentation work carried out in groups (groups of students choose a theme and treat it from a scientific corpus in socio-anthropology of food).

Final assessment: multiple choice, short answer questions, or analysis of a document about the part dealing with psychophysics

Unit 8B: informatic's and statistical tools (4 credits)

Unit supervisor: Laurence Dujourdy

Lecturers :
Laurence Dujourdy, Ludovic Journaux, Wallid Horrigue

Lectures: 14h
Tutorials: 16h
Practicals: -
Project : Yes

In this Unit, students will learn to carry out the statistical analyses needed to properly analyze the different data usually collected when studying consumers' choices and behavior. They will learn the different statistical tests and how to choose a test according to the nature of the dataset they need to analyze. They will apply the statistical tests with two softwares: Excel and R.

Program:

- Introduction to statistics
- Descriptive statistics graphs and regression, using Excel software
- Introduction to R software
- Univariate statistics
    - Inferential statistics on R, confidence intervals, - parametric and non-parametric tests
    - applying these tests in Excel
    - One-way ANOVA, Kruskal-Wallis

Assessment

Ongoing assessment: Students will apply their newly acquired skills and knowledge by analyzing a dataset with the softwares R and Excel. This personal work will be evaluated.
Final exam: multiple choice, short-answer or essay questions

Units of 2nd semester

Unit 9: Nutrition (3 credits)	
Unit supervisor: **Laurent Demizieux**	
Lecturers : Laurent Demizieux, Charles Thomas	Lectures: 16h Tutorials: 8h Practicals: - Project : No

Program

- Introduction to Nutrition
- Understand and measuring Energy expenditure
- Proteins in foods
- Lipids in foods
- Glucids in foods
- Micronutrients
- Epidemiology of Nutrition

Assessment

Ongoing assessment:

- Individual homework: synthesis of 2-3 articles on a topic presented during courses or tutorials
- Work in a pair : presentation of a controversial subject, confrontation of arguments

Final assessment:

Multiple choice, short-answer or essay questions

Courses of this Unit are shared with the students of the major MP2

Unit 10: Information on health and sustainability properties of foods, and consumer behavior (3 Credits)

Unit supervisor: **Gaëlle Arvisenet**

Lecturers:
Gaëlle Arvisenet, Lucile Marty, Juliana Melendrez, Emmanuelle Ricaud Oneto

Lectures: 16h
Tutorials : 8h
Practicals: -
Project: No

Objectives

Consumers are increasingly exposed to various types of information about their food. (content, origin, and quality labels effects on health and environment …). In this unit, students will consider how consumers perceive, understand ad react to various types of information, and how their food perception and diet can be influenced. A focus will be made on information about food sustainability and healthiness.

Program:

- Overview of all the types of information that are provided to consumers about food nutritional or environmental quality
- How consumers pay attention to, perceive, and understand labels, FOP (Front-of-pack), and other information
- How information about healthiness and sustainability of food can influence sensory perception, liking, representations about food, food choice and consumption
- Reverse and unexpected effects of information: When providing information decrease the quality of diet
- Is another communication possible? New strategies to encourage consumers towards a healthier and more sustainable diet
- Methodology issues: overview of the methodological approaches used to study the effect of information

Assessment:

1. Ongoing assessment: Throughout the unit, methodological approaches used to study the effect of information will be addressed. At the end of the unit, students will work by group on a protocol to study a specific question related to the content of the unit. They will present their work to other students

2. Final assessment: Short-answer or essay questions

Courses of this Unit are shared with the students of the major MP2

Unit 11B: Psycho2 (3 credits)

Unit supervisor: **Dimitri Naczaj**

Lecturers :
Dimitri Naczal, Jean-Pierre Thibaut

Lectures: 20h
Tutorials: 12h
Practicals: -
Projects: No

This course will provide students with an introduction to social psychology and development psychology.

Program:

A. Part one: Social psychology

- Introduction to social psychology
  - Definitions & history
  - Applied social psychology
  - Reading a grid of social psychology; cognitive biases
- Scientific method
  - The progress of a scientific study (problematic, resources, hypothesis, research ethics, etc.)
  - The measurements (how to ask the questions, how to administer them, how to calculate and interpret the answers)
  - Questionnaire data submission and processing tools - 4h
- Social Identity
  - Self and identity: Knowledge and self-image, Social comparison
  - The perception of groups: Social categorization, Stereotypes, prejudices & discrimination
- Social influence
  - Standards & conformism: Conformity & minority influence, Authority & rebellion
  - Influence: Attitude & persuasion, Behavior & behavior change

B. Part Two: Development psychology

- Age-related constraints: the development of language and executive functions, problem-solving situation,
- Prolonged attention and information control
- Developmental cognition: Representations and their development, Food as an object of categorization and language.

Assessment

Ongoing assessment: Analysis of a document related to the social psychology program
Final assessment: Multiple choice, short-answer or essay questions, on the development psychology program

Unit 12B: Physiology of perception (3 credits)

Unit supervisor: Frédérique Datiche

Lecturers: Frédérique Datiche, Thierry Thomas d'Anguin, Loïc Briand, Nanette Schneider

Lectures: 16h
Tutorials: -
Practicals : 8h
Project : -

Objectives: The five senses of hearing, taste, smell, touch, and sight play an essential role in feeding behavior and food choices. Senses are involved in our perception of the food we eat and participate in the eating experience. First, this unit will describe the fundamentals properties of senses, and second, we will focus on the chemical senses (olfaction and taste)

Program:

LECTURES

Fundamentals of sensory physiology

-Sensory receptors (different sense organs ; sensory transduction ; receptor potential ; receptive field ; adaptation)

-Sensory circuits (Basic Principles: Divergence-Convergence of sensory information-Parallel/Serial processing unimodal sensory pathways - specific/Multimodal sensory pathways – nonspecific. Microcircuits :Lateral inhibition, Feedback)

-Sensory Perception (the brain transforms sensory messages into conscious perceptions Quality discrimination ; Pattern Recognition)

The olfactory system

-From the olfactory receptors to the brain areas involved in olfactory processing

-Odorants vs. odors: chemical features and perception

The gustatory system

The taste receptors

The brain areas involved in gustatory processing

PRACTICAL

The practical session will be a *Group work* focusing on various key-words : preference-taste-developmental changes, tools to study preference etc…

This will encourage active learning, and develop key critical-thinking, analysis of documents and communication.

Assessment :

Ongoing assessment (coefficient : 1): oral presentation will be organized at the end of the practical session

Final assessment (coefficient : 2). A written exam will be organized to test the knowledge related to the lectures program

Unit 13B: Physiological regulation of eating behavior (6 Credits)

Unit supervisor: Naim Khan

Lecturers : Frédérique Datiche, Corinne Leloup, Naim Khan

Lectures : 30h
Tutorial : 12h
Practical : 4h

Objectives:

The control of feeding behavior is complex. The brain is able to detect the status of energy stores and to match energy intake with expenditure. The gut–brain axis controls appetite and satiety via neuronal and hormonal signals.

This course provides an integrated and physiological overview on how metabolic signals arising from the gastrointestinal tract, adipose tissue and other peripheral organs target the brain to regulate feeding, energy expenditure and hormones.

Program:

Lectures (30h) :

Hypothalamic–pituitary gland system and neuroendocrine regulation of eating behavior

Satiety and satiation : what makes the difference ?

Gastrointestinal mechanisms of satiation for food.

Food intake disorders (hyperphagia, anorexia etc…)

Role of adipokines in metabolism and satiety

***Tutorial (12h)* :**

The role of adipokines in inflammation and metabolic disease

New therapeutic targets for eating disorders and body-weight balance

The example of the anorexia nervosa to illustrate the high prevalence of concomitant medical complications in eating disorders

***Practical (4h)* –**The use of rodent experimental models to investigate the feeding neuronal networks : physiological and behavioural methods

Assessement :

Ongoing assessment (coefficient : 2): oral presentation will be organized during tutorial sessions

Lecture assessment (coefficient : 4). A written exam will be organized to test the knowledge related to the lectures program

Courses of this Unit are shared with the students of the master's course ***NSA***

Unit 14B: Professionalization (6 credits)

Unit supervisor: **Gaëlle Arvisenet**

Lecturers :
Gaëlle Arvisenet, C. Château, Ray Horn, Pierre-Yves Louis

Lectures:	-
Tutorials:	45
Practicals:	-
Project:	YES

Objectives:
The courses of this Unit will bring students to consider their carreer prospects, and to develop transferable skills needed.

Program:

1. Better definition of students' career plans. Methods and knowledge for developing strategies to pursue your career objectives after graduation.
2. Job hunting: developing and implementing career objectives
3. Understand the system of how university research works, identify the different carriers accessible to P2FOOD graduates, the different sectors that recruit, the different types of carriers, and the research landscape across the world
4. Students do a bibliographic search on professional outlets, how to find a PhD…
5. Research communication skills and scientific English
6. Biostatistics: Multiple factors ANOVA

Expected learning outcomes:
This unit will provide to the students a better knowledge of the professional landscape and will help them at better defining their carrier prospects.
They will develop transferable skills for both research and development, or more fundamental research

Assessement:
only ongoing assessment

- Literature review
- Statistics assessment
- Oral presentation

*Courses of this Unit are shared with the students of the major **MP2***

Overview of the program of the 2nd year

2nd year - Semester 1 (September - December) (30 CREDITS)	Unit 1 : In-mouth perception of food and multi-sensory integration (6 CREDITS°
	Unit 2: Cognitive processes involved in food perception and consumption (6 CREDITS)°
	Unit 3: Cerebral basis for food behavior (6 CREDITS)°
	Unit 4: Food choices in specific populations (6 CREDITS)
	Unit 5: Methodology and research training (6 CREDITS)°

2nd year internship (January – June) (30 Credits)	Internship 6 months (30 CREDITS)

Units of 3rd semester

Unit 1: Oral perception & Mutisensory integration (6 credits)

Unit supervisor: Hélène Labouré

Lecturers: Hélène Labouré, Gaëlle Arvisenet, Jordi Ballester, Francis Canon, Arnaud Leleu, Eric Neyraud, Charlotte Sinding, Thierry Thomas Danguin, Carole Tournier, Renaud Brochard

Lectures: 24
Tutorials: 10
Practicals: 8
Project : Yes

Objectives:

The global objective of this unit is to understand the sensory perception of food.
To understand how food properties interact with the oral physiology of the consumer to induce texture and flavor perception, and to find out how to study food texture evolution and flavor release during food consumption
To understand how the information coming from the senses are integrated in the brain to give birth to different perceptions, and how this information interacts between them.

Program:

Part 1: Food Oral Processing
Part1A: Bases and Perception
Part1B: Process in mouth and perception
Part 2: Multisensory integration

Learning outcomes:

Students will understand:

- the various oral operations involved during food oral processing: first bite, chewing and mastication, transportation, bolus formation, swallowing, etc; and the impact of these operations on texture and flavor perception
- the brain processing of the peripheral sensory information and the interaction between the various senses

Students will know:

- how to study mastication properties of subjects and how to measure the evolution of the textural properties of the bolus and the flavor release.
- how to study the sensory interaction

Students will be able to

-propose protocols and/or methodologies and/or techniques to study mastication, flavor release and texture properties of food and/or food bolus and the sensory properties associated
- interpret the results of experiments performed in the field studied.

Assessment:

On-going assessment: oral presentation by group on various themes related to the topics studied in the unit
Final assessment: Written exam on all the content of the unit

Unit 2: Cognitive processes involved in food perception and consumption
(6 CREDITS)

Unit supervisor: Dominique Valentin

Lecturers: Dominique Valentin Iva Capova, Sylvie Chollet, Carole Honoré Chedezeau, Jérémie Lafraire Emmanuelle Ricaud Oneto

Lectures: 22
Tutorials: 18
Practicals: -
Project : No

Objectives:

The purpose of this unit is to learn and think about how the notions of psychology that you learn in M1 can be applied to food related issues

Program:

The unit is organized in three workshops of one day each. The first two workshops are organized by the instructor and the last one by the students.

For the first two workshops, three speakers will give a presentation of 1h30 each. Before the presentations, you will read a few articles written by the speakers to get familiarized with their work and prepare some questions that you will ask them at the end of their presentations.

For the last workshop, you will have to choose a thematic linking psychology and food and organize a coherent program to present the different facets of your thematic. Each of you will prepare a presentation summarizing a few articles corresponding to the topic that you will have chosen within the thematic

Assessment:

Ongoing assessment: Take home exam. Group reports on the first 2 workshops (the reports should be written as a scientific blog to explain to a general public what was presented during the workshop). You will be divided in three groups and each group will be assigned one presentation. You will have to read the scientific articles corresponding to the presentation before the presentation and write the report after the presentation

Final exam: Individual presentations during the 3rd workshop

Unit 3: Cerebral basis for food behavior (6 CREDITS)°

Unit supervisor: Frédérique Datiche

Lecturers: Christopher Aveline, Jean-Marie Bony, Céline Crucciani, Olga Davidenko, David Jariault, Tao Jiang, Naim Khan, Arnaud Leleu, Corinne Leloup, Enrica MontalbanCharlotte Sinding, Vincent Van Waes

Lectures: 32
Tutorials: 8
Practicals: -
Project : (No)

Objectives:

The unit is divided in 2 parts : the first one is intended to offer a focus on tools and models allowing the investigate the brain networks involved in eating behavior, sensory processing and food choices. The second part aims to underline the key role of fat and sugar in the central regulation of appetite as well as the role of rodent model to study the underlying neuronal mechanisms (at cellular level..)

Program:

- EEG markers of sensory perception in the human brain
- Electro-encephalography and olfaction.
- EEG signal post-acquisition analysis
- How to investigate brain processes implied in food perception and consumption by Magnetic Resonance Imaging
- fMRI and eating behavior
- Context effects on food preference and choice Investigation in experimental psychology and fMRI neuroimaging
- Transcranial direct current stimulation (tDCS) to treat addiction-related behaviors: Insights from animal model
- The role of lipid sensing in the control of energy metabolism: physiological and pathophysiologic
- Gustatory perception in obesity
- The role of glucose-sensing in the hypothalamus
-

Learning outcomes:

- To develop a broad understanding of basic tools used in Humans (fMRI, EEG..) ; to be aware of the limitations and advantages of these tools ; to understand that some questions can be addressed in non human models
- To recognize the relationships between neuro- anatomy and function

Assessment:

- CC: short oral presentation
- CT: end- of semester

Unit 4: Food choices in specific populations (6 CREDITS)

Unit supervisor: Sophie Nicklaus

Lecturers: Sophie Nicklaus, Gérard Coureau, Lucile Marty, Sandrine Monnery Patris, Claire Sulmont-Rossé, Paula Varela, Virginie Van Wymelbeke, Remco Havermans, Sophie Vinoy, Eloïse Castagna.

Lectures:	25
Tutorials:	15
Practicals:	-
Project :	Yes

Objectives:

The global objective of this unit is :

-to provide insights into stakes, methods and results regarding food choices in specific populations, such as infants, children elderly, cancer patients;

- to present methodology about research project development

- to provide insight into application of skills to study eating behavior in food industries.

Program:

4.1 Food choices from infancy to adolescence

4.2 Eating behaviour in the elderly and in disease

4.3 Social aspects of eating

4.4 Studying eating behavior in industry

Learning outcomes:

- Methods to conduct research to study eating behavior
- Methodological tools to adapt eating behavior study to specific populations

Assessment:

On-going assessment: oral presentations by group on a mini-research project

Final assessment: Written exam on all the content of the unit

Unit 3: Medothology and research training (6 CREDITS)°

Unit supervisor: Gaëlle Arvisenet

Lecturers: Pierre-Yves Louis, Ray Horn, Marine Pansui, C. Chateau

Lectures:	32
Tutorials:	8
Practicals:	-
Project :	YES

Objectives:

The unit will allow the students to discover

Program:

The unit is composed of courses about several topics and a project, carried out by groups of students.

1. Courses:

- Biostatistics: multivariate analysis
- Research ethics
- Discovering business and industry
- Project management
- Improvement of oral presentation skills

2. Project: students work in a group and use all the knowledge they have acquired during the two years of courses, to create a document (video, flyer, or report, etc…) about a subject linked to the determinants of food choice.

Assessment:

Ongoing assessment only:

- Written exam about biostratistics
- Project
- Oral presentation

Internships

Students cans do their Internships in research laboratories or R&D teams. Interns placement can be in a university, a research institute, a public institution, a company, a consultancy firm, an association, or a non-governmental organization.

At the end of the 1st year (2nd semester): 2 months-internship (6 Credits)

This is an immersion internship, that allows students to discover the functioning of a research laboratory or a company. Students will observe the day-to-day running of a company or a research laboratory, and will better understand the tasks and missions that can be assigned to them after their graduation.

During their internship, they will be involved in a project. Due to the short duration of the internship, they may participate in only certain steps (design of an experiment, helping with data collection, or analysis of data already collected).

The M1 internship necessitates a report written in English. The assessment takes into account the advice of the internship supervisor, the report and an oral presentation.

At the end of the second year (4the semester): 6 months-internship (30 Credits)

This internship is a research or R&D internship. Students are required to manage their own project under the supervision of a senior or junior scientist. They are independent in the implementation of a strategy to respond to a given problem. They choose a methodology, collect data, analyze and interpret it. Following this, they write their Master's thesis in English, in a format similar to that of a scientific paper, and they defend their work in front of a jury composed of two members of the pedagogical team and the internship supervisor. The assessment is based on 3 grades: one given by the internship supervisor, the Master' thesis and the level of the oral presentation.