DEMOCRATIC PEOPLE'S REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH



HARMONIZATION

MASTER TRAINING OFFER

ACADEMIC

Establishment	Faculty/ Institute	Department
Hassiba Benbouali	Faculty of Natural and	Nutrition and
University - Chlef	Life Sciences	Food Sciences

Field: Science of nature and life

Branch: Food Sciences

Specialty: Biology of Nutrition

II – Fiche d'organisation semestrielle des enseignements (Prière de présenter les fiches des 4 semestres)

1- Semester 1 :

Teaching unit	VHS	V.H weekly				Credits	Evaluation mode		
	14-16 week	С	TD	ТР	Personal work	Coeff	14-16 week	С	TD
UE fundamental			-	-	-				
UEF1 (O/P)									
Matière 1 : Physiologie de la digestion	67h30	1h30	1h30	1h30	82h30	3	6	2	1
Matière 2 : Microbiologie digestive	67h30	3h	1h30		82h30	3	6	2	1
UEF2 (O/P)									
Subject 1: Nutritional biochemistry	67h30	3h	-	1h30	82h30	3	6	2	1
Subject 2: Nutritional Pathologies	60h	1h30	1h30	1h	65h	3	5	2	1
UE methodology									
Subject 1: Computer and statistical tools	45h	1h30	1h30		55h	2	4	2	1
UE Découverte									
Subject 1: Scientific English	45h	1h30	1h30		5h	2	2	2	1
UE transversales									
Matière 1 : Communication	22h30	1h30			2h30	1	1	2	1
Total Semester 1	375h	13h30	7h30	4h	375h	17	30		

2-Semester 2 :

	VHS		V.H	weekly			Credits 14-16 week	Evaluation mode	
Teaching unit	14-16 week	С	TD	ТР	Personal work	Coeff		С	TD
UE fondamentales		-	-	-					
UEF1 (O/P)									
Subject 1: Metabolism and physiology of regulation	67h30	3h	1h30		82h30	3	6	2	1
Subject 1: Metabolic Pathology UEF2 (O/P)	67h30	3h	1h30		82h30	3	6	2	1
UEF2 (O/P)									
Subject 1: Animal nutrition and production	67h30	1h30	1h30	1h30	82h30	3	6	2	1
UE methodology									
Subject 1: Nutritional status assessment techniques	60h	1h30	1h30	1h	65h	3	5	2	1
Subject 2: Applied dietetics	45h	1h30		1h30	55h	2	4	2	1
EU discovery									
Subject 1: Oxidative stress	45h	1h30	1h30		5h	2	2	2	1
EU transversal									
Subject 1: Legislation	22h30	1h30			2h30	1	1	2	1
Total Semester 2	375h	13h30	7h30	4h	375h	17	30		

3- Semester 3 :

	VHS		V.H	weekly			Credits	Evaluation mode	
Teaching unit	14-16 week	С	TD	ТР	Personal work	Coeff		continuos	Exam
UE fundamental									
UEF1 (O/P)									
Subject 1: Energy metabolism	67h30	3h	1h30		82h30	3	6	2	1
Subject 1: Biochemistry of metabolism in domestic animals	67h30	1h30	1h30	1h30	82h30	3	6	2	4
UEF2 (O/P)									
Subject 1: Bioenergetics	67h30	3h	1h30		82h30	3	6	2	1
UE methodology									
Subject 1: Analysis of food	COL	1600	1620	16	CEh	2	F	2	4
materials	60n I	1130	1130	In	1160	5	5	۷ ک	1
Subject 2: Food consumption assessment techniques	45h	1h30	1h30		55h	2	4	2	1
UE EU discovery									
Subject 1: Animal experiments	45h	1h30		1h30	5h	2	2	2	1
UE transversal				•					
Subject 1: Entrepreneurship	22h30	1h30			2h30	1	1	2	1
Total Semester 3	375h	13h30	7h30	4h	375h	17	30		

4- Semester 4 :

Field: Science of nature and life

Branch: Food Sciences

Specialty: Biology of Nutrition

Internship in a company with dissertation

	VHS	Coeff	Credits
Personal work	225	9	20
In-company internship	150	6	10
Seminars			
Other (please specify)			
Total Semester 4	375	15	30

5- Overall summary of the training: (indicate the separate global VH in progress, TD, for the 04 teaching semesters, for the different types of UE)

UE	UEF	UEM	UED	UET	Total
VH					
Course	337.5	157.5	67.5	67.5	630
TD	202.5	135	45	-	382.5
TP	67.5	67.5	22.5	-	157.5
Personal work					
Credits				7.5	
	967.5	360	15		1350
PFE Internship					150
		150			150
Total	1575	870	150	75	2670
Credits	72	38	6	4	120
% in credits for					1009/
each EU	60%	31.67%	5%	3.33%	100%

III - Detailed programme by subject (1 detailed sheet per subject)

- Master's title: Biology of Nutrition
- Semester: 1
- Title of the EU: UEF1
- Subject title: Physiology of digestion
- Credits: 6
- Coefficients: 3
- Educational objectives:
- When food arrives at a given segment of the digestive tract, information is sent downstream to warn of this arrival and thus prepare the exocrine and endocrine secretory responses corresponding to the next stages of assimilation. This material deals with the regulations essential for the harmonious functioning of the whole.
- -
- Recommended background knowledge: Animal biology, cell biology
- -

- Continuous of matter:

- I. Structure and functions of the digestive organs
- II. Swallowing and digestive tract motility
- III. Mechanisms of regulation of digestive function
- 1. Nerve regulation
- a. Intrinsic innervation
- b. Sensitive and motor extrinsic innervation
- c. Electrical activity of digestive smooth muscle
- 2. Hormonal regulation
- 3. Phases of gastrointestinal regulation
- IV. Eating behaviour
- 1. Description of feeding behaviour
- a. Feed intake rhythm
- b. Description of an episode of food intake
- 2. Regulatory centres
- 3. Peripheral control signals
- -
- Personal work:
- - Presentations
- - Article analyses

- Assessment mode: Ongoing + final review

- Reference: (Books and polycopies, websites, etc.)
- F. FRIEMEL, G. JARRY, 2004- Physiologie de la digestion. Support cours, Faculté de médecine de Créteil, PCEM2. 25p.
- Support cours pour : Collège des Enseignants de Nutrition, 2011- Régulation physiologique du Comportement alimentaire. *Université Médicale Virtuelle Francophone, 18p.,*
- L. Sherwood. 2006. Physiologie humaine. 2^{eme}Ed. Boeck universitaire,
- R. D. Jurd. 2000. L'essentiel en Biologie Animale. Ed Berti.

Master's title: Biology of Nutrition

Semester 1 Title of the EU: UEF1 Subject title: Digestive microbiology Credits: 6 Coefficients: 3

Objectives of education

Allow understanding of the molecular mechanisms involved in bacterial/bacterial and bacterial/host interactions.

Recommended background knowledge

Master some of the molecular tools for analyzing microbial communities in complex ecosystems to understand the diversity of the digestive microbiota.

- Understand the mechanisms involved in competition between bacteria within the digestive ecosystem

- Know the molecular mechanisms involved in bacteria/bacteria and bacteria/host communication.

- Measure the impact of intestinal microbiota on host health.

Content of the material:

- Diversity of intestinal microbiota
- Intestinal microbial flora.
- Physiological and pathophysiological role of the flora.
- Usefulness of administering live microorganisms.
- Strategies for colonizing the digestive ecosystem: competition, production of bacteriocins, bacteriophages.
- Microbiota/host: a symbiotic relationship
- Microbiology of the digestive tract in patients with chronic enteritis
- Escherichia coli in digestive pathology
- Probiotics and antibiotic therapy

Personal work

Study of scientific articles by pairs and oral presentation,

Evaluation mode: Exam.....

Références

Tap J. 2009.Impact du régime alimentaire sur le microbiote intestinal humain. These de Doctorat de l'Université Pierre et Marie Curie.

Master's title: Biology of Nutrition

Semester 1 EU title: UEF2 Subject title: Nutritional biochemistry Credits: 6 Coefficients: 3

Objectives of education

The course aims to give students the ability to understand the impact of food, nutrients and dietary behaviors on human metabolism, well-being and health through a good knowledge of their effects on the main metabolic pathways, interrelationships between organs and physiological functions of the organism.

Recommended background knowledge General biochemistry

Content of the material:

- The physiology of digestion and absorption
- Metabolism of carbohydrates, lipids and proteins
- The relationship between diet and metabolism

- Examples of characteristic metabolic situations (diabetes, breastfeeding or

undernourishment)

- The relationship between food and protection of human health
- Reduced risk of disease
- The impact of dietary lipids on cardiovascular diseases
- Functional foods.
- Human dietary needs and recommended intakes
- The biochemical justification of these needs
- Aromatics and spices
- General
- Description of some aromatic plants from Algeria
- Culture, morphology, chemical constituents, organoleptic characteristics
- The characteristic constituents of aromatic plants: aromatic active ingredients
- Spices and ingredients based on spices
- Sensory effects of herbs and spices
- Culinary use and employment
- Food, perfume, pharmacy, aromatherapy and toxicity
- Economic importance and standardization

Personal work:

- Presentations
- Article analyses

Assessment mode: Written exam

References (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition

Semester 1 EU title: UEF2 Subject title: Nutritional Pathologies Credits: 5 Coefficients: 3

Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject - maximum 3 lines).

Food can be a health provider, and it can even prevent some diseases, but it can also be a disease provider.

The nutritional diseases module aims to study food-borne diseases, which are common mainly in Algeria and are linked to insufficient or excessive consumption.

Recommended prior knowledge (brief description of the knowledge required to complete this course – maximum 2 lines).

Content of the subject:

INTRODUCTION

- PROTEIN-ENERGETIC MALNUTRITION
- Definition and evaluation
- Importance and distribution
- Metabolic dynamics
- VITAMIN OR MINERAL DEFICIENCY DISEASES
- Mineral deficiencies
- Iron deficiency
- lodine deficiency
- Other mineral deficiencies
- OBESITY
- Definition and evaluation
- Importance and distribution
- Metabolic dynamics
- OTHER DISEASES
- Lipoproteinemia
- Food allergies and intolerances

Personal work:

- Presentations
- Educational visit
- Article analyses

Assessment method: Written examination and presentation of the company visit report

References (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition

Semester 1

Title of the EU: UEM1

Subject title: Computer and statistical tools

Credits: 4

Coefficients: 2

Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject).

Addressing all basic elements of inferential biostatistics, it will also provide the student with basic information regarding regression and variance analysis to two selection criteria.

Recommended background: (brief description of the knowledge required to complete this course – maximum 2 lines).

Mathematical

Continuous of matter:

- Basic concepts on functions, integrals, differential calculus
- Study of probabilities applied to problems of experimental biology
- Basic bases of descriptive statistics and study of useful interpretations in biology

Personal work:

- Presentations
- Article analyses

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.).

- D. Schwartz, P. Lazar, 2001. Statistiques médicale et biologique. Ed Flammarion
- P. Dagnelie, 1999. Statistiques théorique et appliquée. Ed De Boek

Master's title: Biology of Nutrition

Semester 1

Title of the EU: EU1

Subject title: Scientific English

Credits: 2

Coefficients: 2

Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject).

Fluency in functional English

Recommended background knowledge: English

Continuous of matter:

- Study of scientific texts
- Scientific and technical lexicon
- Structure of grammatical sentences

Personal work:

- Presentations
- Article analyses

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition Semester 1 Title of the EU: UET1 Subject title: Scientific communication Credits: 1 Coefficients: 1 Teaching objectives: To master the methodology of experimental research in biology. Know how to write a scientific article, format an essay, thesis or dissertation.

Content of the material

- 1. General information on the scientific approach
- 2. Pre-scientific methods
- 3. Purpose of the scientific method
- 4. Basic premise of the scientific approach
- 5. The main steps in the scientific process
- 6. Good and bad research problem
- 7. Analysis of scientific texts
- 8. The demonstration of a problem
- 9. The defence of a point of view on an issue.
- 10. Bibliographic review, databases
- 11. Implementation of the protocol
- 12. Ethics: key points
- 13. Example of a scientific approach (implementation of the concept studied, causal

relationships, determinations, statistics).

14. Dissemination of results (scientific publication, oral communication, brief)

Personal work:

Oral presentations and posted on examples on scientific topics

Master's title: Biology of Nutrition Semester 2: Title of the EU: UEF1 Subject title: Metabolism and physiology of regulation Credits: 6 Coefficients: 3 Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject – maximum 3 lines).

The objective of the module is to study metabolic processes and the regulation of metabolic flows that ensure the homeostasis of carbohydrates, lipids, proteins, hydromineral and vitaminic according to the different physiological conditions in which the organism may be found .

Recommended prior knowledge (brief description of the knowledge required to complete this course – maximum 2 lines).

Content of the material:

- Hormones involved in the regulation of glucose homeostasis
- Digestion and intestinal absorption of fats
- Lipoprotein transport of lipids
- Triglyceride metabolism
- Fatty acid metabolism
- Consequences of ß oxidation on glucose metabolism
- Physiological and pathological ketogenesis
- Metabolism of cholesterol
- Metabolic regulation: protein catabolism
- Amino acid metabolism
- Movements of water and electrolytes through biological membranes
- Regulatory mechanisms
- Regulation of renal function (endocrine, hemodynamic and nervous factors)
- Regulation of water supply (thirst)
- Regulation of saline inputs
- The phosphocalcic metabolism
- Metabolism of other minerals
- Physiological role of vitamins
- The vitamin interrelationships

Personal work:

- Presentations
- Article analyses

Assessment mode: Written exam References (Books and polycopies, websites, etc.) Master's title: Biology of Nutrition

Semester 2:

Title of the EU: UEF1

Subject title: Metabolic pathology

Credits: 6

Coefficients: 3

Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject).

Know the functional pathologies and their consequences

Recommended background knowledge: (brief description of the knowledge required to complete this course – maximum 2 lines):

Physiology, biochemistry, genetics, nutrition.

Continuous of matter:

I. Strategies for studying integrated functions at the cellular and molecular level in the context of metabolic dysfunctions

- II. Physiopathology of obesity
- II.1. Energy balance
- .2. Control of food intake
- .3. Genetics of obesity
- III. Physiopathology of Diabetes and Insulin Resistance
- III.1. Different types of diabetes
- .2. Insulin signaling and molecular mechanisms of insulin resistance
- .3. Pathophysiology of diabetes
- III.4. Endocrine pancreas
- III.5. Genetics of diabetes
- .6. Exploration of diabetes and insulin resistance
- IV. Main dyslipoproteinemies
- IV.1. Family Hyperlipoproteinemia
- IV.2. Secondary hyperlipoproteinemia
- VI. Pathophysiology of atherosclerosis

- Role of low density lipoproteins
- Role of other lipoproteins
- Inflammation
- VII. Other metabolic diseases

Personal work:

- Presentations
- Article analyses

Assessment mode: Ongoing + final review *Référence :* (Livres et polycopiés, sites internet, etc)

Biochimie clinique par pierre valdiguié, 2000 Lipid and lipoprotein risk factors par rifai nader et warnick russell, 1993 Biochimie de Judith G. Voet, Donald Voet - 2002 - 1380 pages Diabète et maladies métaboliques (4° Ed.) PERLEMUTER Léon, COLLIN DE L'HORTET Gérard, SELAM Jean-Louis 2003 Biochimie structurale et métabolique, de Christian Moussard - 2004 - 326 pages Obésité, par SERVIER *282 pages* édition 2005 Master's title: Biology of Nutrition Semester 2: EU title: UEF2 Subject title: Animal nutrition and production Credits: 6 **Coefficients: 3** Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject). Know the nutritional methods used in improving animal production Recommended background knowledge: (brief description of the knowledge required to complete this course – maximum 2 lines): Physiology, biochemistry, genetics, nutrition. **Continuous of matter:** Nutrition and meat production Nutrition, breastfeeding and milk production Nutrition and growth Nutrition and reproduction

Personal work:

- Presentations
- Article analyses

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition Semester 2: Title of the EU: UEM1 Subject title: Nutritional status assessment techniques Credits:5 Coefficients: 3

Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject - maximum 3 lines).

Be able to differentiate between screening and nutritional assessment. Know the characteristics of screening patients at nutritional risk for early detection of malnutrition. Be able to perform and interpret a nutritional assessment adapted to the situation:

- Know the different aspects that are part of a nutrition assessment.

- Know the pros and cons (limitations) of the different tools used for nutrition assessment.

Be able to carry out practically a nutritional assessment on the healthy subject: train the techniques of anthropometric measurements allowing the measurement of body composition in clinical practice.

Recommended prior knowledge (brief description of the knowledge required to complete this course – maximum 2 lines).

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Content of the subject:

- Undernutrition
- Assessment of nutritional status (measures, standards, interpretations)
- Biological and anthropometric data (weight, body mass index, skin folds)
- Albuminemia: the most widely used biological marker to assess nutritional status
- Analysis of body composition (protein reserves)
- Bioelectric impedance
- The nutritional indices
- Use of nitrogen balance for therapeutic monitoring of nutritional assistance
- Integration into a nutritional care plan (strategy, follow-up...).

Assessment mode: ... Examination...

Personal work:

- Presentations
- Article analyses

References (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition Semester 2: Title of the EU: UEM1 Subject title: Applied dietetics Credits: 4 Coefficients:2

Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject – maximum 3 lines).

Dietetics is a set of dietary prescriptions based on the knowledge of physiological functions at the level of the whole organism, on metabolic processes at the cellular level and on the composition of food, which are organized into a coherent whole and result in the prescription of diets from natural foods or pre-established dietary foods.

The objective of the module is to provide basic knowledge on food composition and diet rules for individuals or communities.

Recommended prior knowledge (brief description of the knowledge required to complete this course – maximum 2 lines).

Content of the material:

- FOOD
- Composition of food
- Meat and fish
- Milk and cheese
- Pulses and protein crops
- The fatty substances
- Vegetables and fruits
- Cereals and derivatives
- Sweet products
- Drinks
- dietary foods
- HOW TO PRESCRIBE A REGIMEN?
- Prescription of a normal diet
- Nutritional control of a diet
- THE SPECIAL REGIMES
- Dietetics as a treatment for nutritional diseases
- Obesity and diabetes
- Anemia due to deficiency
- Protein malnutrition
- Energy malnutrition
- The dislipoproteinemia

Assessment mode: Written exam

Personal work:

- Presentations

References

- Article analyses

(Books

and

polycopies,

websites, etc.)

Master's title: Biology of Nutrition Semester 2: Title of the EU: EU1 Subject title: Oxidative stress

Credits: 2

Coefficients: 2

Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject).

It is a question of knowing the mechanisms of oxidative stress and its consequences on the organism.

Recommended background knowledge

Continuous of matter:

- I. Intracellular redox potential.
- II. Free radicals and reactive oxygen species (ROS).
- III. Chemical properties of free radicals and ROS.
- IV. Oxidation of DNA, proteins, lipids.
- V. Oxidative properties of chemicals.
- VI. Kinetic and thermodynamic control of radical reactions.
- VII. Antioxidant defence systems.
- VIII. Definition of oxidative stress
- IX. Biomarkers of oxidative stress
- X. Consequences of oxidative stress
- X.1. Oxidative stress and aging
- X.2. Stress and cytokines
- X.3. Stress and metabolic dysfunction

Personal work:

- Written work: reports, reports
- Presentations
- Article analyses

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.).

Free radicals and oxidative stress: biological and pathological aspects de Jacques Delattre, Jean-Louis Beaudeux, Dominique Bonnefont-Rousselot, 2005 The Antioxidant Revolution: Slowing Aging and Preventing Disease by Michel Brack and Luc Montagnier (2006)

Oxidative stress and food: Prevention of human diseases by Haïm Tapiero (2006)

Master's title: Biology of Nutrition Semester 2:

Title of the EU: UET1 Subject title: Legislation

Credits: 1

Coefficients: 1

Teaching objectives (describe what the student is expected to have acquired as skills after successful completion of this subject).

This subject should lead the student to reflect on the ethical problems posed by biotechnology applied to human and animal reproduction biology.

Recommended prior knowledge (brief description of the knowledge required to complete this course).

Reproductive biotechnology

Content of the subject:

- research of texts and laws governing manipulations in the field of reproductive biotechnology

- Religion and reproductive biotechnology Bioethics in physiology

Personal work:

Presentations Article analysis

Assessment mode: 01 2-hour exam at the end of semester. **References** (books and polycopies, websites, etc.). required.

Master's title: Biology of Nutrition

Semester 3:

Title of the EU: UEF1

Subject title: Energy metabolism

Credits: 6

Coefficients: 3

Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject). This component deals with energy metabolism regulation.

Recommended background: (brief description of the knowledge required to complete this course – maximum 2 lines).

General biochemistry, cell biology, animal biology

Continuous of matter:

- Metabolic pathways of energy compounds
- o Carbohydrates and carbohydrate regulation
- o Lipids and lipid regulation
- o Proteins and protein regulation
- Food rations
- o Energy requirements
- o Nutritional need
- Dietetic
- Adipose tissue physiology (current concepts)
- Thermoregulation

Personal work:

- Presentations
- Article analyses

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.)- L. Sherwood. 2006. Physiologie humaine. 2^{eme}Ed. Boeck universitaire.

- D. Voet et J. G. Voet. 2004. Biochimie. 2^{eme} Ed. de boeck

- M. Frénot et É. Vierling. 2001. Biochimie des aliments, Diététique du sujet bien portant. 2^{eme} Ed. Doin

Master's title: Biology of Nutrition Semester 3 Title of the EU: UEF1 Subject title: Biochemistry of metabolism in domestic animals Credits: 6 Coefficients: 3

Teaching objectives: Provide physiological knowledge to understand how the animal uses nutrients for meat, milk or egg synthesis: digestive and metabolic specificities of animals, become nutrients and inter-floworgans, biosynthesis of constituents, regulation of production.

Recommended background: general biochemistry Content of the subject:

- Intermediate metabolism of proteins, carbohydrates, lipids and nucleic acids
- Intrinsic and extrinsic regulations.
- Adaptation of these metabolisms at the level of different organs
- Metabolic characteristics of ruminants.

- Role of these biochemical processes in the lactation, growth, reproduction and egg formation

Assessment mode: 3 continuous checks + one final examination

Personal work:

- Board workshop

References: animal nutrition and feed (polycopiated courses), several books on feeding ruminants and poultry, etc.

Master's title: Biology of Nutrition Semester 3 EU title: UEF2 Subject title: Bioenergetics Credits: 6 Coefficients: 3

Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject – maximum 3 lines).

Bioenergetics is all the processes of energy transformation necessary for the maintenance of life, activity, growth and reproduction of living organisms, from the energetic nutrients contained in the diet. The objective of the module is to link theoretical principles of thermodynamics with the mechanisms of transformation of nutrients into energy to ensure the energy regulation of the organism.

Recommended prior knowledge (brief description of the knowledge required to complete this course – maximum 2 lines).

Content of the subject:

- Bioenergy generalities and energy transformation
- Complexity and information in biology
- Principle of equilibrium thermodynamics
- Adenosine triphosphate and chemical energy transfer
- ATP production in ATP cells
- Respiration and atp production in the mitochondria
- Contraction and movement
- Active transport and electrical work
- Chemical work of polyholosides and lipids biosynthesis
- Biosynthesis of informational macromolecules
- Biological information and assembly and cell structure

Assessment mode: Written exam

Personal work:

- Presentations
- Article analyses

References: (Books and copy copies, websites, etc.)

Master's title: Biology of Nutrition Semester 3: Title of the EU: UEM1 Subject title: Food Analysis Credits: 5 Coefficients: 3

Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject – maximum 3 lines).

The scientific development of food science requires in most cases investigation methods and measurement techniques. These techniques, which use classical principles, are insufficient to determine the chemical composition and physico-chemical characteristics of a food material in all its states. This is why other techniques have emerged to meet new requirements. Now, there is a whole arsenal of analytics, ranging from physico-chemical methods to biological methods through microbiological methods that allow in addition to the in-depth knowledge of nutrients, to measure their effectiveness. This module deals with the principles of these different analytical methods of plant or animal origin and includes in addition to a theoretical volume of courses, a series of practical works that will deal with the analysis of the different food systems. Recommended prior knowledge (brief description of knowledge

Content of the subject:

- Purpose of food analysis. Hygienic and nutritional point of view. Legal aspect
- Quality control
- Food legislation
- Preliminary operations for food control
- Methods of determination of the various food constituents
- Toxicology
- Basic principles of toxicology
- Legislation
- Toxic substances that may be present in food
- Anti-nutritional substances
- Heavy metals
- Sycotoxins
- Soil contaminants
- Authorized and unauthorized additives
- Packaging, pesticide residues
- Metabolic pathways of detoxification

Assessment mode: review

Personal work:

- Presentations, Article Analysis, Field Trip
- References (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition Semester 3: Title of the EU: EU12 Subject title: Food Consumption Assessment Techniques Credits: 4 Coefficients: 2

Teaching objectives (Describe what the student is expected to have acquired as a skill after success in this subject – maximum 3 lines).

The assessment of an individual's food ration is, in most cases, based on the questionnaire method which itself depends on many factors inherent to both the interviewer and the interviewee and therefore can strongly bias the results.

Recommended prior knowledge (brief description of the knowledge required to complete this course – maximum 2 lines).

/

Content of the subject:

- Evaluate a patient's dietary intake.
- The collection of information related to food consumption (oral or enteral).
- Method of collecting food intake.
- Description of the population's eating habits and nutritional status.
- Evaluation of food intake for contaminants, additives and other chemicals in food.

- Studies of differences in meal types, energy intake, food and nutrient intake between different subgroups of the population that have been defined by sociodemographic and lifestyle variables.

- Assessment of the adequacy of energy intake and food and nutrient intake in different subgroups of the population with respect to dietary recommendations.

- Identification of sub-groups in the population that are at potential risk due to insufficient or excessive intake of specific nutrients or other foods.

- Possibility to base recommendations on foods rather than nutrients.

References (Books and polycopies, websites, etc.)

Master's title: Biology of Nutrition Semester 3: Title of the EU: EU1

Subject title: Animal testing Credits: 2

Coefficients: 2

Teaching objectives: (Describe what the student is expected to have acquired as skills after successful completion of this subject).

Master the fundamentals of animal testing.

Be able to use the equipment of the physiology laboratory.

Recommended background: (brief description of the knowledge required to complete this course – maximum 2 lines).

General biology, animal biology, anatomy and histology

Continuous of matter:

- Regulation
- Classification of laboratory animals
- Practice of experimentation
- The pet store
- Transport, identification, handling, restraining and feeding of animals
- Food hygiene and control
- Notions on the physiology of laboratory animal organs, stress, pain
- Professional applications

Personal work:

- Presentations
- Article analyses
- Field trip

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.).

- J.V. Laborde. 2000. l'expérimentation et la méthode expérimentale en thérapeutique. Ed. Masson.

- J. Laurent. 1997. Expérimentation animale – Mode d'emploi. Ed. Inserm.

- P. T. Bourin. 1998. Livre blanc sur l'expérimentation animale. Ed. CNRS

Master's title: Biology of Nutrition

Semester 3:

Title of the EU: UET1

Subject title: Entrepreneurship

Credits: 1

Coefficients: 1

- Chapter 1: Launching the Creation Process
- Chapter 2: Strategic planning
- Chapter 3: Business Plan
- Chapter 4: Commercial operations
- Chapter 5: The Company's Marketing Strategy
- Chapter 6: The Company's communication strategy
- Chapter 7: Sources and types of financing for business start-ups

Personal work:

- Presentations
- Article analyses
- Field trip
- Internship in a company

Assessment mode: Ongoing + final review

Reference: (Books and polycopies, websites, etc.).

- J.V. Laborde. 2000. l'expérimentation et la méthode expérimentale en thérapeutique. Ed. Masson.

- J. Laurent. 1997. Expérimentation animale – Mode d'emploi. Ed. Inserm.