PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

Compliance framework C10

TRAINING OFFER

ACADEMIC LICENSE

2022 - 2023

Establishment	Faculty / Institute	Department
Djilali Bounaama University of Khemis Miliana	Faculty of Natural and Life Sciences and Earth Sciences	Biological Sciences

Domain	Branch	Speciality
Natural Sciences and Life scineces	Food Science	Alimentation, Nutrition and Pathologies

ليسانس أكاديمية 2023 – 2023

القسم	الكلية /المعهد	المؤسسة
العلوم البيولوجية	كلية علوم الطبيعة والحياة و علوم	جامعة الجيلالي بونعامة خميس
	الأرض	مليانة

التخصص	الفرع	الميدان
الغذاء ، التغذية وعلم الأمراض	علوم الغذاء	علوم الطبيعة والحياة

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I - Identity card of the License

1 - Location of the training :

Faculty (or Institute): Faculty of Natural and Life Sciences and Earth Sciences Department :Biological Sciences

References of the license authorization decree (attach copy of the decree)

2- External partners

- Other partner establishments:

National Institute of Agronomic Research of Algiers (INRAA) Saad Dahlab University of Blida 1 Hassiba Benbouali University - Chlef University of Tlemcen Abderahman Mira University - Bejaia

Biotechnology Research Center (CRBT)

National Higher School of Biotechnology (ENSB)

- Companies and other socio-economic partners:
 - Wanis Dairy.
 - Arib Ain defla dairy.

- International partners:

3-Context and objectives of the training

A – General organization of the training: position of the project (Required Field)

If several licenses are offered or already supported at the level of the establishment (same training team or other training teams), indicate in the following diagram, the position of this project in relation to the other courses.



B - Training objectives (Required Field)

(Skills targeted, knowledge acquired at the end of the training - maximum 20 lines)

The bachelor's degree in Agri-food Technology and Quality Control will allow candidates to acquire all scientific knowledge related to foods of animal origin (meat, milk and derivatives, etc.), vegetable (fruits and vegetables, cereals, oils, etc.), or microbial (the proteins or lipids of single-celled organisms) from their production to consumption. During this training, the graduate must be made aware of the general approach to the problem of human food and the agro-food industries in its new conception linked to technological development on a global scale. This training will be based essentially on the nutritional aspect of food products, the processing of foodstuffs (physical, chemical,

The training will focus on:

- The composition and properties of food products of vegetable, animal or microbial origin.
- Components of food quality and techniques for their assessment
- Food storage and processing skills
- Industrial food processing and packaging processes
- Hygiene and safety in the food industries
- human nutrition
- New foods or functional foods.

C – Target profiles and skills(Required Field)(maximum 20 lines):

The profile of this training responds well to the requirements of the labor market since the program developed is focusing on the specificities of the food industries requiring skills well appropriate to the industrial activity carried out. The skills targeted are mastering on the quality of raw materials; transformation processes, packaging and marketing of food products. Added to this, the implementation and control of the HACCP system in food production lines.

D – Regional and national employability potential(Required Field)

Thanks to the relevance of this training, the graduates will undoubtedly have the chance to have access to employment within the various units of the food industry, in this case dairies, biscuit factories, butter factories, cheese factories, semolina factories, slaughterhouses, canneries, etc. Possibilities will also be offered to them to work in private or state laboratories for the quality control of food products or the fraud repression of, or to work for companies or organizations managing or storing foodstuffs.

E – Gateways to other specialties (Required Field) Possible gateways: Training in biotechnology

Food Safety Training

Access to post-graduate academic or professional training: Master's or Doctorate in the field of training.

F – Performance indicators expected from the training(Required Field) (Viability criteria, success rate, employability, monitoring of graduates, skills achieved, etc.)

- The progress and evaluation of the different teaching units during each semester.

- The distribution of students according to the choice of specialty.
- The examination success rate evaluated each semester.
- Placement (employment) of graduates after graduation.

C: External teaching team mobilized for the specialty: (Toinform and have approved by the faculty or the institute)

Nom, prénom	Diplôme graduation	Diplôme de spécialité (Magister, doctorat)	Grade	Matière à enseigner	Emargement
AmroucheZoheir	Génie Biologique	Nutrition et transformation des aliments	MCA		
Cheurfa Mohamed	Sciences alimentaires	Nutrition	MCA		- F
Achek Rachid	Dr Vétérinaire	Mcontrole qualité & analyse alimentaire	MCA		A
GuetarniHassina	Sciences alimentaires	Biologie	MCA		$(\Delta$
Sahraoui Hamid	Physiologie animale	Physiologie animale	MCA		<04
BenouaklilFetouma	Microbiologie	Biotechnologie végétale	MCA		27
Saadi Fadhila	Sciences alimentaires	Biotechnologie alimentaire	MCB		Saat
BenshilaSarra	Sciences alimentaires	Nutrition	MCB		Bar
ZaouadiNesrine	Contrôle qualité	Nutrition et transformation des aliments	MCB		19th
NabtiDjahida	Biologie	Biologie	MCB		4
Laissaoui Aicha	Sciences alimentaire	Nutrition	MCB	1	Lalia
Didouh Nassima	Microbiologie	Microbiologie médicale	MCB		DESO
AbdelliWafa	Biotechnologie des micro-organisme	Microbiologie appliquée	MCB		Cop
Lattab Aicha	Biotechnologie des micro-organisme	Microbiologie appliquée	MCB		where the
BouchibaZoulikha	Reseau Biologique	Biotechnologie Microbienne	MCB		aler
SasouiDalel	Biologie	Biotechnologie	MCB		Sale
GhomariFaizaNaouel	Microbiologie	Microbiologie	MAA		
HalfaouiZhor	Dr vétérinaire	Microbiologie	MAA		AP.
ChaouedBilel	Biologie	Physiologie animale	MAA		Gr
Bouras Hassem	Microbiologie	Microbiologie	MAA		Pro
Mostefa Sari Fouzia	Génie biologie	Biotechnologie végétale	MAA		Sat
Ladaidi Aicha	Chimie	Génie des procédés	MAA		the
Brahimi Samira	Biotechnologie	Biotechnologie microbienne	MAA		~
Boukhalfa Nabila	Dr Vétérinaire	Microbiologie	MAA		2

Visa of the department



Faculty or institute visa



D: Overall summary of human resources mobilized for the specialty (L3):

Grade	Internal workforce	External Workforce	Total
Professors	00	-	00
Lecturers (A)	06	-	06
Lecturers (B)	10	-	10
Assistant Professor (A)	08	-	08
Assistant Professor (B)	00	-	00
Other (*)	00	-	00
Total	24	-	24

(*) Technical and support staff

5 – specific Material resources for the specialty

A- Educational Laboratories and Equipment:Educational equipment sheet

existing for the practical work of the planned training (1 sheet per laboratory)

Title of the laboratory:Biochemistry

Capacity of students:20 students

No.	Equipment title	Number	Comments
1	Microscope	02	Good condition
2	Hotplate	01	Good condition
3	Precision scale	02	Good condition
4	pH meter	05	Good condition
5	Chromatography tank	03	Good condition
6	Horizontal electrophoresis tanks	01	Good condition
7	Centrifuge	03	Good condition
8	Water bath	02	Good condition
9	BioRad thermocycler	01	Good condition
10	Optical spectrophotometer	01	Good condition
11	Steamroom	01	Good condition
12	Fridge	01	Good condition
13	Freezer (-20)	01	Good condition
14	Hotplate	04	Good condition
15	Heating magnetic stirrer	04	Good condition
16	Vortex mixer	02	Good condition
17	300V generators	02	Good condition

Title of the laboratory : Micrbiology

Capacity of students : 20 students

No.	Equipment title	Number	Comments
1	autoclave	02	Good condition
2	Automatic autoclave	01	Good condition
3	incubator	02	Good condition
4	Іоор	05	Good condition
5	microscope	03	Good condition
6	loup e	01	Good condition
7	Buns en burner	03	Good condition
8	Sterelizer oven	02	Good condition
9	Colony counter	01	Good condition
10	refrigerator	01	Good condition
11	Analytic scale	01	Good condition
12	Water bath	01	Good condition
13	Vertical laminar flow hood	01	Good condition
14	spectrophotometer	04	Good condition
15	Agitator	04	Good condition

B- internship pitches and company training (see agreements section / agreements)

NB. University is equipped with an SNDL database which contains documents highly focused on the requested specialty.

D- Spaces for personal work and ICT available at department and faculty level:

The various laboratories of the SNV faculty & Research Laboratory ; The libraries of the faculty and the university; The computer room & distance learning; Internet rooms.

II – biannual organization sheet for the teaching of the specialty (S1, S2, S3, S4, S5 and S6)

(including the annexes to the decrees of the common bases of the field and the sector)

Teaching Units		Subjects	Credits	oefficients	H (V	ourly vo Veekly)	lume	SHV (15 weeks)	Other*	Assessment method			
	Code	Title		с С	Course	Tut	PW	· · ·		C	CC*	Examination	
Fundamental TU Code: UEF 1.1	F 1.1.1	General and organic chemistry	6	3	1h30	1h30	1h30	67:30	82h30	x	40%	x	60%
Credits: 18	F 1.1.2	cellular biology	8	4	1h30	1h30	3h00	90h00	110h00	x	40%	x	60%
Coefficients: 9	F 1.1.3	Statistical Mathematics	4	2	1h30	1h30	-	45h00	55h00	x	40%	x	60%
Methodology TU Code: EMU 1.1	M 1.1.1	Geology	5	3	1h30	1h30	1h00	60h00	65h00	x	40%	x	60%
Credits: 9 Coefficients: 5	M 1.1.2	Communication and Expression Techniques 1 (in French)	4	2	1h30	1h30	-	45h00	55h00	x	40%	x	60%
Discovery Teaching Unit Code: UED 1.1 Credits: 2 Coefficients: 2	D 1.1.1	Working Method and Terminolog y 1	2	2	1h30	1h30		45h00	5h00 a.m.	x	40%	x	60%
Transversal TU Code: UET 1.1 Credits: 2 Coefficients: 1	T 1.1.1	Universal History of Biological Sciences	1	1	1h30	-	-	10h30	2h30	-	-	x	100
Total Semester 1		30	17	10h30	9h00	5h30	375h00	375h00					

Other* = Additional work in semi-annual consultation; CC* = Continuous control ; Tut=tutorials ; PW=Practical Work.

Unite	Subjects			cients		Hourly volume (weekly)				Assessment method			
teaching	Code	title	Credits	Coeffic	Course	DW	PW	SHV	Other*	CC*		Examination	
Fundamental TU	F 2.1.1	Thermodynamics and chemistry of solutions	6	3	1h30	1h30	1h30	67:30	82:30	x	40%	x	60%
Code: UEF 2.1 Credits: 18	F 2.1.2	Plant's biology	6	3	1h30	-	3h00	67h30	82h30	x	40%	x	60%
Coefficients: 9	F 2.1.3	Animal Biology	6	3	1h30	-	3h00	67h30	82h30	x	40%	x	60%
Methodology TU Codeh EMU 2.1	M 2.1.1	Physics	5	3	1h30	1h30	1h00	60h00	65h00	x	40%	x	60%
Credits: 9 Coefficients: 5	M 2.1.2	Communication and ExpressionTechniques 2	4	2	1h30	1h30	-	45h00	55h00	x	40%	x	60%
Discovery TU Code: UED 2.1 Credits: 2 Coefficients: 2	D 2.1.1	Life sciences and socioeconomic impacts	2	2	1h30	1h30	-	45h00	5h00	x	40%	x	60%
Transversal TU Code: UET 2.1 Credits: 1 Coefficients: 1	T 2.1.1	Working Method and Terminology 2	1	1	1h30	-	-	10h30	2h30	-	-	x	100%
	Total	Semester 2	30	17	10h30	6h00	8h30	375h00	375h00				

Other* = Additional work in semi-annual consultation; CC = Continuous Control ; Tut=tutorials ; PW=Practical Work.

Units	Subjects	Streedits ⊒⊒		+ v (v	lourly olume veekly)		SHV	Other*	Assessment method			
teaching	Title		Coeff	Course	DW	PW			CC*		Exar	nination
Fundamental TU	Vegetal physiology	4	2	1h30	1h30	1h30	45h00	55h00	x	40%	x	60%
Code: UEF 3.1 Credits: 6 Coefficients: 3	Food system and alimentation	2	1	1h30	-	-	22h00	27h00	x	x	x	100%
Fundamental EU Code: UEF 3.2	Biochemestry	6	3	1h30	1h30	-	67h30	82h30	x	40%	x	60%
Credits: 12 Coefficients: 6	Genetics	6	3	1h30	1h30	-	67h30	80h30	x	40%	x	60%
EU Methodology Code: EMU 3.1 Credits: 4 Coefficients: 2	Expression and communication techniques (in English)	4	2	1h30	1h30	-	45h00	55h00	x	40%	x	60%
TU Methodology Code: EMU 3.2 Credits: 5 Coefficients: 3	biophysics	1	1	1h30	-	-	10h30	2h30	-	-	x	100%
TU Methodology Code: EMU 3.2 Credits: 5 Coefficients: 3	University ethics and deontology	1	1	1h30	-	-	22h30	2h30	-	-	x	100%
Total semster 3		30	17	15h00	7h30	02h30	375h00	375h00				

Teaching units	Subjects	edits	efficients	Hour (V	Hourly volume (Weekly)			Other*	Assessment method			
	Entitled	Č	Coe	Course	DW	PW	(15 weeks)	5	C	CC* Examination		nation
Fundamental EU Code: UEF 4.1 Credits: 6 Coefficients: 3	Animal physiology	6	3	3h00	-	1h30	67h30	82h30	x	40%	x	60%
Fundamental EU Code: UEF 4.2 Credits: 12 Coefficients: 6	Microbiology	8	4	3h00	1h30	1h30	90h00	110h30	x	40%	x	60%
	Food and Technology Base eating	4	2	1h30	1h30	-	45h00	55h00	x	40%	x	60%
EU Methodology Code: EMU 4.1 Credits: 4 Coefficients: 2	Applied Immunology	4	2	1h30	1h30	-	45h00	55h00	x	40%	x	60%
EU Methodology Code: EMU 4.1 Credits: 5 Coefficients: 3	Biostatistics	5	3	1h30	1h30	1h00	60h00	65h00	x	40%	x	60%
Discovery Teaching Unit Code: UED 4.1 Credits: 2 Coefficients: 2	Plants and Environment	2	2	1h30	1h30	-	45h00	5h00	x	40%	x	60%
Transversal UE Code: UET 4.1 Credits: 1 Coefficients: 1	IT tools	1	1	1h30	-	-	10h30	2h30	x	x	x	100%
Total Semester 4		30	17	1:30 p.m.	7:30 a.m.	4:00	375h00_	375h00				

Other* = Additional work in semi-annual consultation; CC* = Continuous control ; Tut=tutorials ; PW=Practical Work..

Semester 5:

	SHV	weekly HV						Assessment method		
Teaching unit	15 weeks	SV	DW	PW	Others	coefficient	oefficient Credits	сс	Examinatio n	
fundamental teaching units								40%	60%	
UEF 3.1.1 (O/P)										
Material 1:Food microbiology	45h00	1h30	-	1h30	55h00	2	4	x	x	
Material 2:Food biochemistry	45h00	1h30	-	1h30	55h00	2	4	x	x	
UEF 3.1.2 (O/P)										
Material 1:LPN Technology 1	67h30	1h30	1h30	1h30*	82h30	3	6	x	x	
Material 2:Food hygiene and safety	45h00	1h30	-	1h30*	55h00	2	4	x	x	
EU methodology										
EMU 1 (O/P)										
Subject 1: statistics and informatics	60h00	1h30	1h30	1h00	65h00	3	5	x	x	
Topic 2: Healthy Foods	45h00	1h30		1h30	55h00	2	4	x	x	
EU discovery										
DEU 1 (O/P)										
Subject: Metrology	45h00	1h30		1h30	5h00	2	2	х	x	
transversal teaching units										
UET1(O/P)										
Subject: English	10h30	1h30			2h30	1	1	-	X (100%)	
Total Semester 5	375h00	12h00	3h00	10h00	375h00	17	30			

* and educational outing

Semester 6:

	SHV		weekly H	V				Assessment method		
Teaching unit	15 weeks	sv	Tut	PW	Others	coefficient	Credits	CC (40%)	Examination (60%)	
fundamental teaching units										
UEF 3.2.1(O/P)										
Material 1: Food toxicology	45h00	1h30	-	1h30	55:00	2	4	x	x	
Material 2: Analysis techniques	67h30	3h00	-	1h30	82:30	3	6	x	x	
UEF 3.2.2(O/P)								x	x	
Material 1: LPN Technology 2	90h00	3h00	1h30	1h30	110h00	4	8	x	x	
EU methodology										
EMU 1(O/P)										
Subject 1: Food Preservation	60h00	1h30	1h00	1h30	65h00	3	5	x	x	
EMU 2(O/P)										
Subject: Process Engineering	45h00	1h30	1h30		55h00	2	4	х	x	
EU discovery										
DSU 1(O/P)										
Subject 1: Hygiene in food industries	45h30	1h30	1h30		5h00	2	2	x	x	
transversal teaching units										
UET 1 (O/P)										
Material 1:Entrepreneurship	10h30	1h30	-		2h30	1	1	-	X (100%)	
Total Semester 6	375h	1h30	5h30	6h00	375h	17	30			

* and educational outing

Overall summary of the training:(indicate the separate global VH in progress, TD, TP... for the 06 teaching semesters, for the different types of TU)

TU VH	UEF	MTU	DTU	TTU	Total
Course	585	292h30	135	135	1147h30
DW	225	240	112.5	1	577h30
PW	405	97:30	22.5	1	525
Personal work	1485	720	30	15	2250
other (explain, list,)					
Total	2700	1350	300	150	4500
Credits	108	54	12	6	180
% in credits for each teaching unit	60	30	6.67	3.33	100

Practical work

PW N°1:Principles of experimental chemistry

Objective: To assess the student's knowledge of the equipment used in chemistry experiments and the safety rules to be observed in the laboratory.

PW N°2:Determination of the amount of material

Objective: To determine the quantity of Subject (expressed in number of moles) contained in a sample and to prepare a sample containing a fixed quantity of Subject

PW N°3: Preparation of solutions by dissolution and by dilution

Objective: This is to prepare a solution of sodium chloride (NaCl) of normality 0.1N. and to prepare a hydrochloric acid (HCl) solution of normality 0.1N by diluting a solution of HCl of normality 1N.

PW N°4:Measurement of the density of a few....

Objective: We want to determine the density of a saturated salt water solution and to determine the density of iron.

PW N°5:Search for functional groups

Objective: Identify functional groups: Alcohols and carbonyls.

Assessment method

Continuous checks and half-yearly examinations

References

1. Jacques Maddaluno, Véronique Bellosta, Isabelle Chataigner, François Couty, et al., 2013. Chimie organique. Ed. Dunod, Paris, 576 p.

2. Jean-François Lambert, Thomas Georgelin, Maguy Jaber, 2014. Mini manuel de Chimie inorganique. Ed. Dunod, Paris, 272 p.

3. Elisabeth Bardez, 2014. Mini Manuel de Chimie générale : Chimie des Solutions. Ed. Dunod, Paris, 256 p.

4. Paula Yurkanis Bruice, 2012. Chimie organique. Ed. Pearson, 720 p.

5. Jean-Louis Migot, 2014. Chimie organique analytique. Ed. Hermann, 180 p.

Semester :1st Semester TU:Fundamental Teaching Unit Subject 2:cellular biology

Teaching objectives

The objectives of this teaching is to introduce students to the living world at the cellular level, to acquire the basic notions of the cell, eukaryote and prokaryote, and to study the cellular components. These objectives are reinforced by practical sessions in the laboratory.

Recommended prior knowledge: The student must have knowledge in General Biology.

Subject content:

1.Generalities

- 1.1.Classification and relative importance of the living kingdoms
- 1.2.Cell and cell theory
- 1.3. Origin and evolution
- 1.4.Cell types (Prokaryote, Eukaryote, Acaryote)

2. Studying cell Methods

- 2.1.Optic and electron microscopy methods
- 2.2.Histochemical methods
- 2.3.Immunological methods
- 2.4. Enzymological methods
- 3.Plasma membrane: structure and function
- 4.Cytoskeleton and cell motility
- 5.Cell adhesion and extracellular matrix
- 6.Chromatin, chromosomes and cell nucleus
- 7. Ribosome and protein synthesis
- 8. The endoplasmic reticulum-Golgi apparatus system
- 9.The interphase nucleus
- 10.The endosomal system: endocytosis
- 11.Mitochondria
- 12.Chloroplasts
- 13.Peroxisomes

14.Extracellular matrix

15.Plant cellular wall

Tutorials / Practical work:

1.Methods of studying cells

- 1.1.Separation of cell components
- 1.2. Observation of cellular components
- 1.3.Identification of cellular components
- 1.4.Plant wall

2.Cell cultures

3. Tests of physiological functions

- 3.1.Reconstruction of the function from the isolated components
- 3.2. Anatomical tests: autoradiography, fluorescence markings, green

fluorescent proteins.

3.3.Physiological tests: control of the expression of a protein, mutation,

Overexpression.

Assessment method

Continuous control and semester examinations

References

1. B. Albert, A. Johnson, J. Lewis, M. Raff, K. Roberts et P. Walter, 2011. Biologie moléculaire de la cellule. Ed. Lavoisier, Paris, 1601p.

2. Abraham L. Kierszenbaum, 2006. Histologie et biologie cellulaire: Ed De Boeck, 619p.

3. Thomas Dean Pollard et William C. Earnshaw, 2004. Biologie cellulaire. Ed. Elsevier Masson, Paris, 853p.

4. Marc Maillet, 2006. Biologie cellulaire. Ed. Elsevier Masson, Paris, 618p.

Semester :1st Semester

TU:Fundamental Teaching Unit

Subject 3 : Mathematics, Statistics

Teaching objectives: This subject allows the student to integrate statistical and computer tools in the biological field, and to use numerical analysis, probability and calculation by computer tools.

Recommended prior knowledge: The student must have knowledge of functions,

integrals and random variables.

Subject content:

1.Math analysis

- 1.1.One-variable function, derivative and integrals
- 1.2. Approximation method
- 1.3. Series, series with positive terms, Rieman series
- 1.4. Multivariate Functions, Partial Derivatives, Differentials
- 1.5.Double and triple integrals
- 1.6.Calculation of surfaces and volumes

2.probabilities

- 2.1.Random variables, Bernoulli variables
- 2.2. Statistical laws and bio-statistical applications
 - 2.2.1.Discrete laws (Binomial and Poisson)
 - 2.2.2.Continuous law (Gauss, reduced centered normal law, chi II law, Fischer law)
- 2.3. Parameters and properties
 - 2.3.1.Position parameters (median, mode, mean,....etc)
 - 2.3.2. Dispersion parameters (variance, standard deviation,etc)
 - 2.3.3.Shape parameters (symmetry, flattening,....etc)
- 2.4. Distribution function and density function

Assessment method

Continuous control and semster exam

References

1. Jean Bouyer, 2000. Méthodes statistiques : médecine-biologie. Ed. Estem.

2. Gilles Stoltz et Vincent Rivoirard, 2012. Statistique mathématique en action. Ed. Vuibert, Paris, 448p.

3. Maurice Lethielleux, 2013. Statistique descriptive. Ed. Dunod, Paris, 160p.

4. Maurice Lethielleux et Céline Chevalier, 2013. Probabilités : Estimation statistique. Ed. Dunod, Paris, 160p.

Semester :1erSemester

TU:Methodological Teaching Unit 1 Subject :Geology

Teaching objectives: Subject allows students to see the components and structure of the terrestrial globe, the interactions between these components, the external and internal geodynamics.

Recommended prior knowledge: No prerequisites

Subject content:

1.General geology

- 1.1.Introduction
- 1.2.Earth
- 1.3.Earth's crust
- 1.4.structure of the earth

2. External geodynamics

- 2.1.Erosion
 - 2.1.1.The action of water
 - 2.1.2.The action of the wind
- 2.2.Deposits
 - 2.2.1.Study methods
 - 2.2.2.sedimentary rocks
 - 2.2.3. Notion of stratigraphy
 - 2.2.4.Paleontology concept

3.Internal geodynamics

- 3.1.Seismology
 - 3.1.1.Study of earthquakes
 - 3.1.2. Origin and distribution
 - 3.1.3.Soft and brittle tectonics (folds and faults)
- 3.2.Volcanology
 - 3.2.1.Volcanoes
 - 3.2.2.Magmatic rocks
 - 3.2.3.Magma study
- 3.3.Plate tectonics

Practical work

PW N°1 : Topography PW N°2 : Geology (Cuts) PW N°3 : Rocks and minerals

Assessment method

Continuous control and semster examination

References

1. Jean Dercourt, 1999. Géologie : cours et exercices. Ed. Dunod, Paris,

2. Denis Sorel et Pierre Vergely, 2010. Initiation aux cartes et aux coupes géologiques. Ed. Dunod, Paris, 115p.

3. Jean Tricart, 1965. Principes et méthodes de la géomorphologie. Ed. Masson, Paris, 496p.

Semester : 1st Semester

TU:Methodology Teaching Unit

Subject 2: Communication and expression techniques 1 (in French)

Teaching objectives : This subject aims to understand and write scientific documents in French as well as the use and translation of scientific terms.

Recommended prior knowledge : No prerequisites

Subject content:

1.Scientific Terminology

2.Text study and comprehension

3. Technique of written and oral expression (report, synthesis, use of modern means

of communication)

4.Expression and communication in a group. Study of proposed texts (observe, analyze, take stock, written expression)

Tutorials :

Proposal of exercises related to the points of language considered the most important.

Assessment method

Continuous control and semester examination

References

Scientific articles and dissertations

Semester :1st Semester

TU: Discovery Teaching Unit:

Subject : Working Method and Terminology 1

Teaching objectives: Helping students to design research the methods of and synthesis work according to scientific rules.

Recommended prior knowledge: The student is supposed to have basic notions about bibliographic research.

Subject content:

- Introduction to bibliographic
- research Writing a scientific report
- Introduction to reading and understanding a scientific article

Assessment method

Continuous control and semi-annual review

References:

Books, websites, etc.

Semester : 1st Semester TU: Transversal Teaching Unit Subject : Universal history of biological sciences

Teaching objectives: This program must emphasize on the history of biology, and the question of life through eras and civilizations. It must highlight the place of technical progress that leaded to the evolution of biology.

Recommended prior knowledge:No prerequisites.

Material content:

- 1.Prehistory
- 2.antiquity
- 3.Middle Ages
 - 3.1.In Occident
 - 3.2.In the East (Muslim civilization)
- 4. Sixteenth and seventeenth centuries:
- 5. Eighteenth century: Darwin
- 6.Nineteenth century: cell theory (microscopy), Sexuality Embryology, Molecular Biology
 - (DNA) Genetics
- 7. Twentieth century: gene therapy and cloning

Assessment method

Semester examination

Reference

- 1. Denis Buican, 2008. Darwin dans l'histoire de la pensée biologique. Ed. Ellipses, 232p.
- 2. Christophe Ronsin, 2005. Histoire de la biologie moléculaire. Ed. De Boeck, 106p.
- 3. Jean Théodoridès, 2000. Histoire de la biologie. Ed. Puf, 127p.

Semester : 2ndSemester

TU:Fundamental Teaching Unit

Subject 1: Thermodynamics and chemistry of mineral solutions

Teaching objectives: This course provides a certain understanding of the principles governing the transformations and interactions of Subject, the principle of thermodynamics, energy balance, and the kinetics of chemical reactions.

Recommended prior knowledge : The student must have knowledge of oxidation-reduction reactions.

Subject content:

1.Chemical balances

1.1. Acid-base balance

- 1.1.1.Definition according to: Arrhenius; Bronsted; lewis
- 1.1.2.Equilibrium constant: water dissociation, acidity and basicity
- 1.2.3. The pH: water, a strong monoacid, a strong monobase,

1.2. Redox balance

- 1.2.1.Redox reaction: electron transfer
- 1.2.2.Oxidation number
- 1.2.3.Writing redox reactions
- 1.2.4. Electrochemical cells
- 1.2.5.Redox potential
- 1.3. Precipitation equilibrium: Solubility and solubility product
 - 1.3.1.Definition
 - 1.3.2. Effect of ion addition on solubility
 - 1.3.3.Effect of pH

2.Chemical kinetics

- 2.1.Definition
- 2.2.reaction speed
- 2.3.Expression of the rate law and order of a reaction
- 2.4. Factors influencing reaction rate

3. Thermodynamics

3.1. Thermodynamic systems and quantities: Thermodynamic functions and

transformations

- 3.2. First law of thermodynamics
 - 3.2.1.Expression of work and heat
 - 3.2.2.Expression of internal energy and enthalpy
- 3.3. Second law of thermodynamics
 - 3.3.1.Expression of entropy
 - 3.3.2.Expression of free energy and free enthalpy
- 3.4. Thermochemistry
 - 3.4.1.Heat of reactions
 - 3.4.2. Enthalpy of reactions
 - 3.4.3.Calculating the internal energy of a reaction
 - 3.4.5.Kincgoff's Law
 - 3.4.6.Hess's Law
- 3.5. Prediction of the direction of reactions
 - 3.5.1.Isolated systems
 - 3.5.2.Calculation of reaction entropies
 - 3.5.3.Reactions at constant temperature
 - 3.5.4.Calculation of free enthalpy and free energy of a system.
- 4. Mineral chemistry

Tutorials :

Exercise N°1 : Chemical kinetics

- Exercise N°2 : Acid-base balances and precipitation balances
- Exercise N°3 : Redox balances
- Exercise N°4:Thermodynamics and thermochemistry
- Exercise N°5 : Organic Chemistry (Reaction Mechanisms)

Practical work

Practical work N°1: Chemical kinetics

Part 1 :Experimental determination of the order of the reaction

Objective :Determination of the order of the reaction with respect to sodium thiosulfate (Na₂S₂O₃)

using the initial velocities method.

Part 2 :Influence of temperature on reaction rate

Objective :Determination of reaction rates for the same concentration of reactants but for different

temperatures.

Practical work N°2: Titrimetric analysis method in acid-base. Acid-base neutralization

Part 1: Dosage by colorimetry

<u>Objective</u> :

- Dosage of a strong acid solution (HCl) with a strong base (NaOH).
- Determination of the concentration of a weak acid solution (CH3COOH) with a strong base solution (NaOH).

Part 2 : Dosage by pH meter

Objective : Dosage of a weak acid solution (CH3COOH) with a strong base (NaOH).

Practical work N°3: Titration by the oxidation-reduction method. Manganimetric determination of Fe2+

Objective :

- Determination of the normality of a given solution of KMnO₄
- Determination of Fe concentration2+contained in a solution of FeSO₄.

Practical work N°4 : Identification of ions and separation of precipitates by centrifugation

Objective :

- Identify the ions present in a solution
- Write the chemical formulas of an ionic compound in solution
- Write precipitation reactions
- Express the relationship between equilibrium constant and solubility.

Assessment method

Continuos control and half-yearly examination

References

1. John C. Kotz et Paul M. Treichel, 2006. Chimie des solutions. Ed. De Boeck, 376p.

2. René Gaborriaud et al., Thermodynamique appliquée à la chimie des solutions. Ed. Ellipses, 335p.
TU:Fundamental Teaching Unit Subject 2:General plant biology

Teaching objectives: The objective of this subject is to teach students the fundamental principles of the tissue organization of plants, and their development. Recommended prior knowledge:The student must have certain notions about the different parts of a plant.

Subject content:

- 1.Introduction to plant biology
- 2.Different types of fabrics
- 2.1.Primary meristem (root and cell)
- 2.1.1.Primary tissues
- 2.1.2.Protective tissues (epidermis)
- 2.1.3.Filling tissues (parenchyma)
- 2.1.4. Supporting tissues (collenchyma and sclerenchyma)
- 2.1.5.Conductive tissues (primary xylem, primary phloem)
- 2.1.6.Secretory tissues
- 2.2.Secondary (lateral) meristems (the cambium and the phellogen)
- 2.2.1.Secondary tissues
- 2.2.2.Conductive tissues (secondary xylem and secondary phloem)
- 2.2.3. Protective tissues (suber or cork, phelloderm)
- 3. Anatomy of higher plants

Academic year: 2022 - 2023

- 3.1.Root study
- 3.2.Stem study
- 3.3.leaf study
- 3.4. Comparative anatomy between mono and dicots
- 4. Morphology of higher plants and adaptation
- 4.1.Roots
- 4.2.Leaves
- 4.3.rods

Establishment: U. Khemis Miliana Title of the license: food, nutrition and pathologies		
5.Gametogenesis	5.2. Ovu	
4.6.Fruits	en	
4.5.Seeds	5.1.	
4.4.flowers 4.5.Seeds	5.	

page 37 m and embryo sac

6.Fertilization
6.1.egg and embryo
6.2.Concept of development cycle
Practical work :
Practical work N°1 : Morphological study of Angiosperms (roots-stems-leaves-flowers)
Practical work N°2 : Morphological study of Gymnosperms (roots-stems-leaves-flowers)
Practical work N°3 : Primary meristems (root and stem)
Practical work N°3 : Primary meristems (root and stem)
Practical work N°4 : Covering fabrics: epidermis – piliferous layer – corky layer - suberoid
Practical work N°5 : Parenchyma (chlorophyllian-reserve-aeriferous-aquifer)
Practical work N°6 :Supporting tissues (collenchyma-sclerenchyma)
Practical work N°7 : Secretory tissues (hairs-glands-tannins-laticifer cells)
Practical work N°8 : Primary conductive tissues (phloem-xylem)

Assessment method

Continuos control and half-yearly examination

Reference

Alain Raveneau et al., 2014. Biologie végétale. Ed. De Boeck, 733p.
 Jean François Morot-Gaudry et al., 2012. Biologie végétale. Ed. Dunod, Paris, 213p.

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Semester : 2nd Semester TU:Fundamental Teaching Unit Subject 3:General animal biology

Teaching objectives: This module consists of introducing students to the particularities of the

developmental biology of certain animal species.

Recommended prior knowledge : No prerequisites.

Material content:

First part: Embryology

- 1.Introduction
- 2.Gametogenesis
- 3.Fertilization
- 4.Segmentation
- 5.Gastrulation
- 6.Neurulation: becoming sheets
- 7.Delimitation: appendages of birds
- 8.Particularities of human embryology (Cycle, nidation, development of annexes, placenta)

Second part: Histology

- 1.Lining epithelia
- 2.Glandular Epithelia
- 3.Connective tissues
- 4.Blood tissue
- 5.Cartilaginous tissues
- 6.Bone tissue
- 7.muscle tissue
- 8.Nervous tissues

Titles : Practical Works-Tutorials

No. 1:Gametogenesis	No. 2:Fertilization segmentation in the sea urchin	
No. 3:bird amphibian gastru	ulation No.	No. 4:Exercises on gastrulation and neurulation
5:neurulation appendages	birds	No. 6:Human embryology

Assessment method

Continuous control and semi-annual examination

References

Paul Richard W. Histologie fonctionnelle

Semester : 2nd Semester EU:Methodology Teaching Unit Subject 1:Physics

Teaching objectives: The objective of this course is to enable students to acquire knowledge related to the basic notions of physics that can be used in the SNV field.

Recommended prior knowledge : Students must have basic notions in mathematics and

mechanics.

Material content:

- 1.math reminder
- 1.1.Physical quantities and dimensional analysis

1.2.Calculation of errors (Different types of errors, calculation of uncertainties and significant figures).

2.Optical

- 2.1.1.Introduction (lens of optics)
- 2.1.2.Nature of light (spectrum of electromagnetic waves, photons, waves, etc.)
- 2.2.Geometrical optics

2.2.1.Principles of geometrical optics and propagation of light.

- 2.2.2.Refraction (Snell-Descarte's laws, limiting angle and total reflection)
- 2.2.2.1.Plane diopters, conjugation formula, Blade with parallel faces and Prism.
- 2.2.2.Spherical diopters (convergent, divergent), conjugation formula and geometric

construction (image construction).

2.2.2.3.Thin lenses (convergent, divergent), conjugation formula, magnification, association of two

thin lenses and geometric construction (image construction).

- 2.2.3.Reflection
- 2.2.3.1.Plane mirror (image construction)
- 2.2.3.2 Spherical mirror (image construction, conjugation formula)
- 2.2.4.Optical instruments
- 2.2.4.1.The eye
- 2.2.4.1. magnifying glass and optical microscope
- 3.Fluid mechanics
- 3.1. Definition and characteristics of a fluid.

- 3.2. Hydrostatics (Fundamental relationship of hydrostatics, buoyancy, float)
- 3.3.Hydrodynamics (loss, continuity equation, Bernoulli's theorem)
- 4. Concept of crystallography
- 5. Notions of spectral analysis

Tutorials :

- N°. 1. Exercises on dimensional analysis and the calculation of errors.
- N°. 2.Exercises on the propagation of light, plane diopters and the prism
- $N^{\circ}\!.$ 3.Exercises on spherical diopters and thin lenses.
- N°. 4. Exercises on plane and spherical mirrors and the reduced eye.
- Nº. 5. Exercises on Pascal's law and Archimedes' thrust. (Hydrostatic)
- Nº. 6.Exercises on Bernoulli's law (hydrodynamics)

Assessment method

Continuous checks (presentation + test) and Semester examination.

References

- 1. Christophe Texier, 2015. Mécanique quantique. Ed. Dunod, Paris.
- 2. Eugene Hecht, 1998. Physique. Ed. De Boeck, 1304p.
- 3. Michel Blay, 2015. Optique. Ed. Dunod, Paris, 452p.

Semester : 2nd Semester

TU:Methodology Teaching Unit

Subject 2:Communication and Expression Techniques 2 (in English)

Goals Education : This subject complete learning of the understanding and writing scientific documents in English.

Recommended prior knowledge: No prerequisites.

Material content:

- 1. Scientific Terminology
- 2.Text study and comprehension
- 3. Technique of written and oral expression (report, synthesis, use of modern means of
- communication)
- 4. Expression and communication in a group. Study of proposed texts (observe, analyze, take

stock, written expression)

Tutorials :

Proposal of exercises related to the points of language considered the most important.

Assessment method

Continuos control and half-yearly examination.

References

Scientific papers

Semester : 2nd Semester

TU: Discovery Teaching Unit

Subject : Life sciences and socio-economic impacts

Teaching objectives : Helping students to conceive of professions indirectly directly or linked to the various specialties of the natural and life sciences.

Recommended prior knowledge:No prerequisites.

Subject content:

1. Animal and plant production (breeding, processing, production, etc.)

2. Toxicology and environmental health (effect of pollutants on plant and animal life and on human health)

3. Biology and health (talk about the interest of biology in the diagnosis of animal and plant diseases),

4. Biotechnology and molecules of interest (pharmaceutical and food industry),

- 5. Biology and criminalistics
- 6. Terrestrial and marine ecosystems (management of parks, etc.)
- 7. Technical-commercial biology (ex: commercial delegate).

Assessment method

Continuous control and semi-annual review

References :

Books, websites, etc.

Semester : 2nd Semester

TU: Transversal Teaching Unit **Subject:** Working method and terminology 2

Teaching objectives:Helping students to design research the methods of and synthesis work according to scientific rules.

Recommended prior knowledge : The student is supposed to have notions in bibliographic

research.

Material content:

- Terminology
- Writing a scientific report
- Introduction to reading and understanding a scientific article

Assessment method

Semester examination

References

Scientific papers

Semester: 3rd Semester

TU:Fundamental Teaching Unit 1 Subject 1: Plant Physiology

Teaching objectives

This subject allows students to have general notions about plant systematics (interest of classification in botany, notions of species and identification, evolution and classification of the plant kingdom), and getting the sense of observation : one of the essential bases of the biologist's approach.

Prior knowledge recommended (*brief description of the knowledge required to be able to follow this course – Maximum 2 lines*).

The student must master concepts in Botany and Plant Physiology.

Content of the subject

Part 1 Nutrition

- 1. Reminder of the basic concepts
- 1.1. Organization of a plant
- 1.2. Organization of a plant cell
- 4 Water nutrition (mechanism of water absorption and transit)
- 4 Sweating and water balance
- 3.1. Highlighting
- 3.2. Location and measurement
- 3.3. Change in perspiration
- 3.3.1. influence of plant morphology
- 3.3.2. influence of environmental factors
- 3.4. Physiological determinism of perspiration
- 3.5. The water balance of plants
- 3.6. Interest of transpiration for plants

- 4 Mineral nutrition (macro and trace elements)
- 5 Nitrogen nutrition (nitrogen cycle, transport and assimilation of nitrates)
- 6 Carbon Nutrition (Photosynthesis)

Part 2: Development

- 1. Seed formation
- 2. Sprouting
- 3. Growth
- 4. Flowering
- 5. Fruiting

Practical work

A. Water nutrition

- PW N°1 : Osmolarity (spectrophotometry)
- PW N°2 : transpiration

PW N°3 : Stomata

B.Mineral nutrition

PW N°4 : Growth of broad bean seedlings in different nutrient solutions

C.Nitrogen nutrition

- PW N°5 : Total protein electrophoresis
- PW N°6 : Breathing
- PW N°7 : Separation of pigments by chromatography

D.Growth

- PW N°8 : Growth of seedlings in different solutions
- PW N°9 : Tropisms
- $PW\ N^{o}\ 10$: Seeds germination

Assessment method

Continuous control and semi-annual review

References

1- Béraud J., 2001- Le technicien d'analyses biologiques. Guide théorique et pratique.Ed. Tec et Doc, Paris, 208p. 2- Dupont G., Zonszain F. et Audigié C., 1999- Principes des méthodes d'analyse biochimiques. Ed. Doin, Paris, 207p.

3- Burgot G., Burgot J.L., 2002- Méthodes instrumentales d'analyse chimique et applications : Méthodes chromatographiques, électrophorèses et méthodes spectrales.
Ed. Tec et Doc, Paris, 306p.

4- Heller R., Esnault R. et Lance C., 2005- Physiologie végétale : Tome 1, Nutrition. Ed. Dunod, Paris, 209p.

5- Morot-Gaudry J.F., Moreau F. et Prat R., 2009- Biologie végétale : Nutrition et métabolisme. Ed. Dunod, Paris, 224p.

Semester: 3rdSemester TU : Fundamental Teaching Unit 1 Subject 2 : Food and food system

Teaching objectives

Prior knowledge recommended (*brief description of the knowledge required to be able to follow this course – Maximum 2 lines*).

No prerequisites

Content of the subject

- 1. History and evolution of food
- 2. Food security
- 3. Conventional food system (conventional sources of nutrients)
- 4. Unconventional food systems (recovered proteins, biomass recovery, etc.)

Assessment method

Continuous control and semi-annual examination.

References

Semester : 3rd SemesterTU : Fundamental Teaching Unit 2Subject 1 : Biochemistry

Teaching objectives

This subject consists of teaching the fundamental bases of biochemistry and the notions of enzymology, and familiarizing students with biochemical techniques.

Prior knowledge recommended (brief description of the knowledge required to be able to follow this course – Maximum 2 lines).

The student must have some knowledge of chemical bonds (weak and strong) and of the physicochemical properties of organic molecules.

Content of the subject

- 1. Chemical bonds
 - 1.1. Strong links
- 1.2. Weak bonds
- 2. Structure and physico-chemical properties of carbohydrates
 - 2.1. simple dares
 - 2.2. Oligosides
 - 2.3. Polysaccharides, heterosides.
- 3. Structure and physico-chemical properties of lipids 3.1. Simple lipids
 - 3.2. Complex lipids
 - 4. Structure and physico-chemical properties of amino acids, peptides and proteins
 - 4.1. Amino acids, peptides, proteins
 - 4.2. Structure (primary and secondary, tertiary and quaternary)
 - 4.3. Properties and effect of treatments (solubility, electrophoretic behavior, denaturation.)
 - 4.4. Protein separation

5. Notions of enzymology

5.1. Definition, classification

	5.6.
	Allos
5.2. action Mechanisms	tery
	phen
5.3. Active website	ome
5.4. Enzyme kinetics and types of representation	non
5.5. Enzymatic inhibition	6.
	Noti
Establishment: II. Khemis Miliana Title of the license: food, nutrition and nathologies	

ons of bioenergetics

- 6.1. Types of chemical reaction
- 6.2. The respiratory chain and energy production
- 6.3. Phosphorylation and redox reaction
- 7. Carbohydrate metabolism
- 7.1. Catabolism (glycolysis, glycogenolysis, pentose phosphate pathway, Krebs cycle, energy balance)
- 7.2. Anabolism (gluconeogenesis and glycogenesis)
- 7.3. Regulation
- 8. Lipid metabolism
- 8.1. Catabolism of fatty acids (Beta-oxidation)
- 8.2. Sterol catabolism
- 8.3. Biosyntheses of fatty acids and triglycerides
- 8.4. Sterol biosynthesis
- 8.5. Regulation
- 9. Peptide and Protein Metabolism
- 10. 9.1. Catabolism of amino groups
 - 9.2. Catabolism of carboxylic groups
 - 9.3. Side chain catabolism
 - 9.4. Glucoforming and ketogenic acids
 - 9.5. Biosynthesis of essential amino acids
 - 9.6. Nitrogen removal, urea cycle
 - 9.7. Example of peptide biosynthesis (case of peptides with biological activity)
 - 9.8. Example of protein biosynthesis
 - 9.9. Regulation
 - 10. Structure and metabolism of other compounds of biological interest
 - 10.1. vitamins
 - 10.2. hormones

Assessment method

Continuous control and semi-annual review

References

1.Cathérine Baratti-Elbaz and Pierre Le Maréchal, 2015- Biochemistry. Ed. Dunod, Paris, 160p.

2.Norbert Latruffe, Françoise Bleicher-Bardelett, Bertrand DucloS and Joseph Vamecq, 2014-Biochemistry. Ed. Dunod, Paris.

3.Serge Weinman and Pierre Méhul, All biochemistry. Ed. Dunod, Paris, 464p.

4. Françoise Lafont and Christian Plas, 2013- Biochemistry exercises. Ed. Doin, Paris, 410p.

Semester : 3rd Semester TU : Fundamental Teaching Unit 2 Subject 2 : Genetics

Teaching objectives

This subject allows the student to acquire the notions and terminology of genetics, the transmission of characters, the structure of DNA, replication, transcription, alterations and the mechanisms of regulation of gene expression.

Prior knowledge recommended (*brief description of the knowledge required to be able to follow this course – Maximum 2 lines*).

The student must have knowledge of nucleic acids and Mendelian genetics.

Content of the subject

1. Genetic material

- 1.1. Chemical nature of genetic material
- 1.2. Structure of nucleic acids (DNA-RNA)
- 1.3. DNA Replication: in Prokaryotes and Eukaryotes
- 1.4. Chromosome organization
- 2. Transmission of genetic characters in eukaryotes
- 3. Haploid Genetics
 - 3.1. independent genes
 - 3.2. Related genes
 - 3.3. Establishment of genetic maps
 - 4. Genetics of diploids
 - 4.1. independent genes
 - 4.2. Related genes
 - 4.3. Establishment of genetic maps
- 5. Bacterial and viral genetics
 - 5.1. Conjugation
 - 5.2. Transformation
 - 5.3. Transduction

- 5.4. Mixed infection in viruses
- 6. Protein Synthesis
 - 6.1. Transcription
 - 6.2. Genetic code
 - 6.3. Translation
- 7. Gene Mutations
- 8. Chromosomal mutations 8.1.

Structural variation

- 8.2. Numerical variation (human example)
- 9. Gene structure and function: biochemical genetics
- 10. Regulation of gene expression
 - 10.1. Lactose operon in prokaryotes
 - 10.2. Example in eukaryotes
- 11. Notions of extra-chromosomal genetics
- 12. Concept of population genetics

Tutorials:

- Tut N°1:Genetic material
- Tut N°2:Transmission of characters
- Tut N°3:Mono and di hybridism (Special cases)
- Tut N°3:Related genes
- Tut N°4:Genetic maps
- Tut N°5:Protein Synthesis (Genetic Code)
- Tut N°6:Fine structure of the gene (intragenic recombination)
- Tut N°7:Conjugation and factorial map
- Tut N°8:Population genetics
- Tut N°9:DNA extraction
- Tut No. 10: DNA assay
- Tut No. 11:BARR corpuscle

Assessment method

Continuous control and semi-annual examination

References

1- Pasternak J.J., 2003- Génétique moléculaire humaine. Ed. De Boek, 522 p.

2- Harry M., 2008- Génétique moléculaire et évolutive. Ed. Maloine.

3- Watson J., Baker T., Bell S., Gann A., Levine M. et Losick R., 2010- Biologie moléculaire du gène. Ed. Pearson.

4. Henry J.P. et Gouyon P.H., 2003- Précis de Génétique des Populations. Ed. Dunod.

Semester : 3rd Semester
TU : Methodological Teaching Unit 1
Subject : Communication and Expression Techniques

Teaching objectives (*Describe what skills the student is supposed to have acquired after passing this subject – maximum 3 lines*).

Learn and apply research methods and the collection of useful and essential information for the synthesis and the written form (report, oral, defense). Application of English grammar in a scientific context.

Prior knowledge recommended (*brief description of the knowledge required* to be able to follow this course – Maximum 2 lines).

Certain notions of terminology and research methodology acquired in L1.

Content of the subject

- 1. Study of proposed texts (observe, analyze, take stock, written expression)
- 2. Terminology
- 3. Bibliographic research methodology.
- 4. Methods of writing scientific reports.

Assessment method

Semester examination

References

(Books and handouts, websites, etc.), Research article.

Semester : 3rd Semester TU : Methodology Teaching Unit 2 Subject : Biophysics

Teaching objectives

The general objective of the teaching of the biophysics course is to allow SNV students to acquire the basics in biophysics.

Prior knowledge recommended(*brief description of the knowledge required to be able to follow this course – Maximum 2 lines*).

Content of Subject

I.1. Gases: elements of kinetic theory, equation of state of ideal or real gases, changes of state

- I.2. Liquids: structure of water, dissolution
- I.3. Solids: different structures
- I.4. Intermediate states: glasses, liquid crystals, granular states, deformable polymers
- II. General information on aqueous solutions
- II.1. Study of solutions: classification of solutions

II.2. Concentrations: molar fraction, molarity, molality, concentration by weight, osmolarity, equivalent concentration.

II.3. Solubility

II.4. Electrolyte solutions: electrical conductivity, physical and chemical properties of electrolytes

- III. Surface phenomenon
- III.1. Surface tension: definition, measurements and biological applications
- III.2. Capillarity phenomenon: definition, measurements and biological applications
- III.3. Adsorption
- IV. Diffusion phenomenon
- IV.1. Diffusion
- IV.2. Osmosis phenomenon and osmotic pressure: definition, measurements and
- biological applications
- IV.3. Permeability: definition, measurements and biological applications

- V. Study of viscosity
- V.1 Laminar and turbulent flow
- V.2. Viscous resistance
- V.3 Sedimentation
- VI. Sound and ultrasonic waves
- VI.1. The sound wave and its properties: production, nature and classification of sound waves.
- VI.2. The Doppler effect: definition, measurements and biological applications.
- VI.3. Ultrasound: definition, measurements and biological applications.

Practical work: (do at least 3 practical exercises)

Practical work N°1 : Surface tension

- Practical work N°2 : Conductometric titration
- Practical work N°3 : Titration by PH meter
- Practical work N°4 : Viscosity measurement
- Practical work N°5 : Spectrophotometer

Practical work N°6 : Refractometer

Assessment method

Continuous checks (presentation + test) and Semester examination.

References (Books and handouts, websites, etc.):

- F. Grémy et J. Perin. Eléments de Biophysique. Tome 1 et 2. Flammarion. Paris.
- C. Bénézech et J. Llory. Physique et Biophysique. Masson et Cie. Paris, 1973.
- Y.THOMAS, 2000, Biophysique à l'usage des étudiants en sciences biologique, Bréal, Paris.
- A. Bertrand, D. Ducassou et JC. Healy. Biophysique. Utilisation médicale des rayonnements Vision Audition.

Semester : 3rd Semester
TU : Discovery Teaching Unit
Subject 1 : Environment and sustainable development

Teaching objectives

This teaching aims to make students aware of the issues, content and actions of sustainable development. It is a question of making them aware that it is possible to act for the preservation of the environment, through their training, as well as at their level, on their consumption, their daily activities and their society. During his university education, whatever his specialty and his ambition for his future professional orientations, the student will have the opportunity to learn and experience his knowledge of sustainable development.

Sustainable development is currently one of the responses that is emerging around the world, to deal with the current conjunction of the world's major ecological, economic and societal challenges.

Prior knowledge recommended(brief description of the knowledge required to be able

to follow this course – Maximum 2 lines).

No prerequisites

Content of the subject

- 1. Definitions:Environment, components of an environment, sustainable development.
- 2. Meaning of development?

2.1. The main dimensions of the environmental crisis: human demography, global warming, fossil fuels (non-renewable), depletion of natural resources, drinking water, biodiversity and agriculture

- 2.2. Durable development, why?
- 2.3. The Concept of Sustainable Development
- 2.4. The domains of sustainable development

2.5. SD principles and their origins: precaution, prevention, responsibility, solidarity, equity, polluter pays

2.6. Some indicators of sustainable development:ecological footprint and biocapacity, impact on the environment, environmental performance index, human development index, GDP: gross inferior product (economic) and enrollment rate boys/girls (societal), accessibility to healthcare (societal). 2.7. Environmental education, Awareness and nature animation, environmental communication,

Program for personal work

1-Find examples in the press (international and national) illustrating the principles of sustainable development (precaution, responsibility, for example). Presentation and discussion.

2-Test ecological reflexes

3-Comparison of the life cycle of a biodegradable product and a non-

biodegradable product

4-Illustrate the polluter pays principle by taking an example of a polluting company

in Algeria taking into account national legislation.

5-Give examples of the implementation of preservation, conservation or restoration of environments

Assessment method

Continuous control and semi-annual examination

References (Books and handouts, websites, etc.):

Semester : 3rd Semester **TU** : Transversal Teaching Unit **Subject** : University Ethics and Deontology

Teaching objectives

The general objective of this course is to enable SNV students to acquire the resources of deontology and professional ethics.

Prior knowledge recommended(*brief description of the knowledge required to be able to follow this course – Maximum 2 lines*).

Content of the Subject

1.INTRODUCTION: Contexts of the Algerian university

- 2.CONCEPTS
- 2.1 Morale
- 2.2 Ethics
- 2.3 Ethics
- 2.4 Right
- 2.5 Professional values
- 2.6 Learning and teaching
- 2.7 Didactics and pedagogy

3. THE CHARTER OF ETHICS AND UNIVERSITY DEONTOLOGY

- 3.1 Fundamentals
- 3.2 Rights
- 3.3 Obligations and duties
 - 4. APPLICATIONS
 - 4.1 Teaching: courses, evaluation of knowledge and behavior
 - 4.2 Scientific research: research methodology, plagiarism, copyright, scientific writing......

Assessment method

Semester examination

References

- Bergadaà, M., Dell'Ambrogio, P., Falquet, G., Mc Adam, D., Peraya, D., & Scariati, R. (2008). La relation éthique-plagiat dans la réalisation des travaux personnels par les étudiants.
- Charte de l'éthique et de la déontologie universitaires, Alger, mai 2010 www.mesrs.dz
- Gilbert Tsafak, Ethique et déontologie de l'éducation Collection Sciences de l'éducation Presses universitaires d'Afrique, 1998
- Gohier, C., & Jeffrey, D. (2005). Enseigner et former à l'éthique. Presses Université Laval.
- Jaunait, A. (2010). Éthique, morale et déontologie. Poche-Espace éthique, 107-120.

Semester : 4thSemester TU: Fundamental Teaching Unit 1 Subject : animal physiology

Educational objectives of the course

animal physiology is a basic teaching of the understanding of the physiological phenomena intervening during the human food.

- a. .Knowledge of the physiology of digestion and tissue and cell nutrition and its position in all major functions: role and interactions.
- b. Physiological phenomenon within the biological matrices source of foods of animal origin: Tissue and cellular phenomena within the raw materials of foods of animal origin (meat, fish and meat products, egg and egg products).

At the end of this teaching, the student will be able to explain physiological phenomena and to understand their origin, the process and their results.

Prior knowledge recommended Knowledge of animal

biology and physiology.

Content of the subject

- 1. Physiology of Breathing
- 2. Nervous system
- 3. Cardiovascular system
- 4. Circulatory system
- 5. Elimination and secretion

Staff :

- Compulsory and optional reading of resources and course materials indicated by the teacher
- Preparation of practical work topos and writing of reports

Practical work proposal:

- Histology practical work : realization of histological sections, observation, comparison between healthy tissues and/or subject to a pathology
- Practical work on the study of blood parameters: the membrane permeability of animal cells (red blood cells)... -

Assessment method:

Continuous assessment, examination, etc...(The weighting is left to the appreciation of the training team)

References (Books and handouts, websites, etc.):

- MARIEB Elaine Nicpon : Anatomie et Physiologie humaines, (2016), édition De Boeck Université.
- SILBERNAGL et DESPOPOULOS : Atlas de poche de physiologie, (2011) 3e édition, Flammarion.
- Travaux pratiques de physiologie animale, (2009) Université de Bretagne Nord

1

Semester : 4thSemester

TU : Fundamental Teaching Unit 2 Subject 1 : Microbiology

Teaching objective

The student must acquire the notions of the microbial world, the techniques used to observe microorganisms, bacterial growth and classification.

Prior knowledge recommended(brief description of the knowledge required to be able

to follow this course – Maximum 2 lines).

The student must have a global notion of pathogenic agents.

Content of the Subject

- 1. The Microbial World
 - 1.1. Historical
 - 1.2. Place of microorganisms in the living world
 - 1.3. General characteristics of the prokaryotic cell
- 2. The Bacterial Cell
 - 2.1. Bacterial Cell Observation Techniques
 - 2.2. Cell morphology
 - 2.3. Wall
 - 2.3.1. Chemical composition
 - 2.3.2. Molecular structure
 - 2.3.3. Functions
 - 2.3.4. Gram stain
 - 2.4. The plasma membrane
 - 2.4.1. Chemical composition
 - 2.4.2. Structure
 - 2.4.3. Functions
 - 2.5. The cytoplasm
 - 2.5.1. Ribosomes
 - 2.5.2. Reserve substances
 - 2.6. The chromosome
 - 2.6.1. Morphology
 - 2.6.2. Composition
 - 2.6.3. Chemical replication

- 2.6.4. Structure
- 2.7. Plasmids
 - 2.7.1. Structure
 - 2.7.2. Replication
 - 2.7.3. Properties
- 2.8. Pilli
 - 2.8.1. Structure
 - 2.8.2. Function
- 2.9. The capsule
 - 2.9.1. Morphology
 - 2.9.2. Chemical composition
 - 2.9.3. Functions
- 2.10. Cilia and flagella
 - 2.10.1. Highlighting
 - 2.10.2. Structure
 - 2.10.3. Functions
- 2.11. the spore
 - 2.11.1. Morphology
 - 2.11.2. Structure
 - 2.11.3. Sporulation phenomena
 - 2.11.4. Properties
 - 2.11.5. Sprouting3.
- 3. Bacterial classification
 - 3.1. Phenetic classification
 - 3.2. Phylogenic classification
 - 3.3. Bergey classification
- Bacterial Nutrition
 - 4.1. Basic needs
 - 4.2. Growth factors
 - 4.3. Trophic types
 - 4.4. Physico-chemical parameters (temperature, pH, O2and aW)
- Bacterial growth
 - 5.1. Growth measurement
 - 5.2. Growth Parameters
 - 5.3. Growth curve (batch culture)

- 5.4. Bacterial culture
- 5.5. Antimicrobial agents.
- 6. Notions of mycology and virology 6.1.
 - Mycology (yeast and mold)
 - 6.1.1. Taxonomy
 - 6.1.2. Morphology
 - 6.1.3. Reproduction
 - 6.2. Virology
 - 6.2.1. Morphology (capsid and envelope)
 - 6.2.2. Different types of viruses

Practical work :

- PW N°1 : Introduction to the microbiology laboratory
- PW N°2 : Method of studying microorganisms and the different sterilization processes
- PW N°3 : Seeding methods;
- PW N°4 : Microscopic study of bacteria, simple staining
- PW N°5 : Morphological study of the different bacterial colonies on culture medium
- PW N°6 : Gram staining
- PW N°7 : Culture media
- PW N°8 : Study of bacterial growth
- PW N°9 : Criteria for the biochemical identification of bacteria
- PW No. 10 : Yeasts and cyanobacteria
- PW N°11 : Growth inhibitors, antibiogram

PW N°12 : Isolation of the total and specific flora of certain products (water, milk, etc.).

Assessment method

Continuous control and semi-annual review

References

1. Henri Leclerc, Jean-Louis Gaillard et Michel Simonet, 1999- Microbiologie générale. Ed. Doin, Paris, 535p.

2. Jerome Perry, James Staley et Stephen Lory, 2004- Microbiologie-Cours et questions de révision. Ed. Dunod, Paris, 889p.

3. Jean-Pierre Dedet, 2007- La microbiologie, de ses origines aux maladies émergentes. Ed. Dunod, Paris, 262p.

Semester: 4th SemesterTU : Fundamental Teaching Unit 2Subject 2: Foods and Food Technology Basics

Teaching objective

Introduction to the basic definitions of food and the multitude of food groups and the degrees and processes of transformation. At the end of this course, the student will be able to differentiate the food groups and to know their characteristics as well as the bases of their manufacture and transformation of agricultural raw materials.

Prior knowledge recommended(*brief description of the knowledge required to be able to follow this course – Maximum 2 lines*).

The student must have basic knowledge of the immune system.

Content of Subject

- 1. Food groups
- 2. General food characteristics
- 3. Introduction to food processing and production technologies
- 4. Unit operations of food processes
- 5. Effect of processing on food quality

Staff :

Compulsory and optional reading of resources and course materials indicated by the teacher

Proposal for field trips : Food production unit visit.

Assessment method:

Continuous assessment, examination, etc...(The weighting is left to the appreciation of the training team)

References :

- Benjamin K. Simpson & collaborators: Food biochemistry and food processing. Wiley-Blackwell. 2012.

- Arnold Bender : Food processing and nutrition. Academic press. 1978.

Semester:4thSemester

TU : Methodological Teaching Unit 1

Subject : Applied Immunology

Teaching objective

Introduction to basic definitions of terms and methods used in immunological analysis. At the end of this teaching, the student will be able to differentiate the techniques of immunology and to know their principle.

Prior knowledge recommended(brief description of the knowledge required to be able

to follow this course – Maximum 2 lines).

No prerequisites

Content of Subject

I – Generalities

- I-1 Antigen-antibody reaction
 - Antigen
 - Immunogenicity
 - Antigenicity
 - Antibody
 - Isotypes
- I-2 Supplement
- II- Immunology techniques
- II-1-Precipitation reaction
- II-1-1 Precipitation in liquid medium, Precipitation in gelled
- medium II-1-2 Immunodiffusion
- II-1-3 Single immunodiffusion, Double immunodiffusion, Radial immunodiffusion
- II-1-4 Immuno-electrophoresis
- II-1-5 Electro-immunodiffusion or electrosyneresis
- II-2- Agglutination and hemagglutination reaction: Coombs test

II-3- Neutralization reaction

II-4-Complement fixation reaction and hemolysis II-5-

Techniques using enzyme-labeled reagents II-5-1 Enzyme

immunoassay technique (ELISA)

II-5-2 Direct ELISA, indirect ELISA, sandwich ELISA

II- 6- Techniques using reagents labeled with fluorochromes II-

- 6-1 Immunofluorescence technique
- II-6-2 Direct immunofluorescence, Indirect immunofluorescence
- II-7-Techniques using radiolabeled reagents: Radioimmunoassay (RIA) II-8-

Vaccination and serotherapy

- II-9-Technique of monoclonal antibodies
- II-10- Diagnosis of pathologies affecting the immune system:
- II-10-1 Hypersensitivity,
- II-10-2 Autoimmune diseases,
- II-10-3 Organ transplantation,
- II-10-4 Immune deficiencies

Assessment method

Continuous control and semi-annual review

References(Books and handouts, websites, etc.):

Semester : 4thSemester TU : Methodology Teaching Unit 2 Subject : Bio Statistics

Teaching objective

The objective of this teaching is to provide certain methodological tools classically used to describe and test biological phenomena.

Prior knowledge recommended(brief description of the knowledge required to be able

to follow this course – Maximum 2 lines).

The student must have notions of probability and numerical analysis already seen in the first

year.

Content of the subject

- 1. Reminders
 - 1.1. Reminders on descriptive statistics
 - 1.1.1. Position parameters
 - 1.1.2. Dispersion Parameters
 - 1.1.3. Shape Parameters
- 2. Reminders on the main distribution laws : distributions: normal and log normal,

Student, Pearson, Fischer-Snedecor...

- 3. Statistical Inference: Hypothesis Testing
 - 3.1. Compliance testing
 - 3.2. Comparison test
 - 3.3. Independence test
- 4. Correlation study and Regression 4.1.
 - Correlation coefficient
 - 4.2. Correlation significance test
 - 4.3. Simple linear regression
 - 4.3.1. Regression line (least squares method)
 - 4.3.2. Confidence interval of regression estimate
 - 4.3.3. Significance test of the regression coefficients
- 5. One-way and two-way analysis of variance

The use of software such as Statistica or SAS as practical work for each chapter which will be covered in detail in the third year.

Tutorials :

Series of exercises on each chapter of the course

Assessment method

Continuous control and semi-annual examination

References (Books and handouts, websites, etc.):

- 1. BENZEON J.P., 1984- L'analyse des données. Ed. Bordas, Tomes I et II.
- 2. HUET S., JOLIVET E. et MESSEON A., 1992- La régression non linéaire : méthodes et applications en biologie. Ed. INRA.
- 3. TROUDE C., LENOUR R. et PASSOUANT M., 1993- Méthodes statistiques sous Lisa statistiques multi variées. CIRAD-SAR, Paris, PP : 69-160.

Semester : 4th Semester TU : Discovery Teaching Unit Subject : Plants and Environment

Teaching objective

This subject aims to initiate the classification and anatomical characterization of the major groups of the plant kingdom.

Prior knowledge recommended(brief description of the knowledge required to be able

to follow this course - Maximum 2 lines).

The student must have notions of probability and numerical analysis already seen in the first year.

Subject Content

Definitions, concepts and classification criteria.

Systematics of major plant groups

- 1. Algae
 - 1.1. Prokaryotic Algae (Cyanophytes / Cyanobacteria)
 - 1.2. Eukaryotic Algae, systematics and particularities of the main groups
 - Glaucophyta, Rhodophyta, Chlorophya and Streptophyta
 - The Haptophyta, Ochrophyta, Dinophyta, Euglenozoa, Crytophyta, Cercozoa
- 2. Fungi and lichens
 - 2.1. Systematics and peculiarities of the main groups of fungi
 - Myxomycota and Oomycota
 - Eumycota (Chrytridiomycota, Zygomycota, Glomeromycota, Ascomycota,

Basidiomycota)

- 2.2. A particular algae-fungus association: lichens
- 3. Embryophytes
 - 3.1. Bryophytes
 - Marchantiophytes, Anthocerotophytes and Bryophytess. str.

3.2. Pteridophytes

- Lycophytes, Sphenophytes and Filicophytes
- 3.3. Gymnospermssensu lato

-Cycadophytes, Ginkgophytes, Coniferophytes and Gnetophytes

- 3.4. Angiosperms
- Vegetative apparatus, Morphology and Floral Biology
- Notion of modern systematics and Diversity of Angiosperms
- Primitive Angiosperms, Monocotyledons, Eu-Dicotyledons
- Main families of angiosperms
- 4 Relations of plants with the environment
- Relationships of plants with organisms in an ecosystem,
- Plant adaptations to the environment

Assessment method

Continuous control and semi-annual review

References (Books and handouts, websites, etc.):
Semester : 4th Semester EU:Transversal Teaching Unit Subject : Computer tools

Teaching objective

Introduction to the basic definitions of the computer resource operating system. At the end of this course, the student will be able to design documents and tables in Word and Excel.

Prior knowledge recommended(brief description of the knowledge required to be able to follow this course – Maximum 2 lines).

Content of Subject

- I. Discovery of the operating system
- Definition of an OS
- Different existing OS: Windows, Linux and Mac OS.
- II. Discovery of the office suite
- Design documents on WORD.
- Design tables with EXCEL.
- Design of a presentation with Powerpoint.
- Introduction to Latex.
- III. Software and algorithms
- Definition of software.
- Definition of algorithmic.
- use of algorithms in biology.

Assessment method:

Semester examination

Semester : 5th semster FundamentalTeaching Unit 2 (3.1.2) Subject1 : Biochemistry of Food and Regulation Credits: 4 Coefficient: 2

TeachingObjectives: Describe what the student is expected to have acquired as skills after succeeding in this subject - maximum 3 lines. Acquiring this subject will allow students to recognize the daily energy needs through knowledge of the energy and structural role of proteins, lipids, and carbohydrates.

Recommended Prerequisite Knowledge: Brief descriptionof therequired knowledge and prerequisites for following this subject - maximum 2 lines. For a good understanding of the contents of this subject, the necessary knowledge and prerequisites are: Animal Biology - Biochemistry.

SubjectContent:

- I- Energyneedsandbioenergetics
- II- Proteins
- 1- Anabolism
- 2- Catabolism
- 3- Proteincontentinthebody
- 4- Nitrogenbalance
- III- Carbohydrates
- 1- Structureandclassificationofsugars(Glc,Fructose,Gal,Lactose,Sucrose...)
- 2- Catabolism(glycogenolysis,glycolysisinaerobicandanaerobicconditions)
- 3- Carbohydratecontentofmain foods
- IV- Lipids
- 1- Structureandclassification
- 2- Catabolism(actionoflipases,activationoffattyacids,β-oxidation)
- V- Moleculartransformations(oxidation,condensation,denaturationreactions...)

Assessment Method (Typeofassessmentandweighting):

Continuous assessmentands emester examination

References:

Food biochemistry. 2008. Alais et al. Biochemistry of foods.2002. Doins editions.

Semester : 5th Semster FundamentalTeaching Unit 2 (UEF3.1.2):NutritionalandFoodBiochemistry Subject 2 : Dietetics and Food Composition Credits : 4 Coefficient : 2

Objectives of the teaching: Describe what the student ise xpected to have acquired as skills after succeeding in this subject - maximum 3 lines.

After acquiring this subject, the student will make the connection between the subject's age and their intake compared to their nutritional needs. Knowledge of the composition of different foods will enable them to achieve a balanced diet for good health.

Recommended prior knowledge : succinct description of the knowledge required to follow this teaching - maximum 2 lines).

For a good understanding of the content of this subject, the necessary knowledge and prerequisites are: Biochemistry.

Content of the subject:

I-Intake and Needs

- 1- Recommended intake of minerals and vitamins
- 2- Protein needs
- 3- Carbohydrate needs
- 4- Needs for lipids and essential fatty acids
- 5- Special needs(age,pregnancy,breast feeding,sports...)

II-Dietetics as a djunct therapy

- 1-Nutritional prescription
- 2- Application of dietetics in pathologies (CVD, nephropathy, gout, osteoporosis,

digestive pathologies, deficiencies, eating disorders...)

III- Food composition

- 1-Water and minerals
- 2-Drinking water(coffee, tea, herbal teas, sodas, alcohol...)
- **3-Tracee lements**
- 4-Foods rich in protein
- 5-Foods rich in lipids
- 6-Foods rich in carbohydrates
- 7-Fruits and vegetables
- 8-Condiments

Establishment: U. Khemis Miliana Title of the license: food, nutrition and pathologies Academic year: 2022 - 2023

9-Vitamins

IV- PreventiveNutrition

Evaluation mode (Type of evaluation and weighting): Continuous assessment and semester examination

Bibliographicreferences

Dieteticsand Nutrition.2009.Apfelbaumet al. Practical Manual of Nutrition. 2009. Médart.

Semester:5th Semseter

Unit of Fundamental Teaching 2 (3.1.2): Nutritional and Food Biochemistry

Subject : Nutrition and Pathologies

Credits : 4 Coefficient : 2

Teaching Objectives (Describe what the student is expected to have acquired as skills after succeeding in this subject -maximum3 lines). After passing this subject, the student will be able to make a systemic reasoning combining nutritional needs and deficiencies related to physiological dysfunctions leading to major metabolic diseases.

Recommended prerequisite knowledge (succinct description of the required knowledge to be able to follow this teaching - Maximum2 lines).

For a good understanding of the contents of this subject, the necessary knowledge and prerequisites are:

Physiology of major functions

Content of the subject:

I- Metabolic diseases

- 1- Regulation off asting and post prandial glycemia
- 2- Physiopathology of hyper glycemia
 - Type 1 Diabetes
 - Type 2 Diabetes
- 3- Molecular mechanisms of insulin resistance
- 4- Metabolic Syndrome
- 5- Physiopathology of hypoglycemia
- 6- Lipoprotein metabolism
- 7- Physiopathology of dyslipoproteinemia
- 8- Physiopathology of phenyl ketonuria

II- Other pathologies related to nutrition

- 1- Food allergies
- 2- Cancers...

Evaluation mode (type of evaluation and weighting): Continuous assessment and semester examination

Bibliographical references

Metabolic Diseases of Nutrition. 1977. Lubetzky Treatise on Diabetology. 2005. Grimaldi et al.

Semester: 5th Semester

Unit of Fundamental Education 1 (3.1.1.): Human Physiology

Subject 2: Digestive Physiology Credits: 4 Coefficient: 2

Teaching Objectives: Describe what the student is supposed to have acquired as skills after successfully completing this subject - maximum 3lines). Indirect relation to nutrition, the knowledge acquired in this subject will allow students to better situate their specialization in relation to the major functions.

Recommended prerequisite knowledge: Brief description of the knowledge required to be able to follow this teaching - maximum 2 lines). For a good understanding of the content of this subject, the necessary knowledge and prerequisites are: Animal biology.

Subjectcontent:

- I -Generalities on digestion
- II -Food intake, swallowing and salivary secretion
- **III** –Esophageal transit
- IV –Gastric motility and secretion
- V -Motility of the small intestine and post-pyloric secretions
- VI -Colonic motility and defecation
- VII The sequence of digestive processes
- VIII -Digestive simplifications of carbohydrates, proteins and lipids
- IX Transcriptional effects of nutrients

Evaluation mode (type of evaluation and weighting):continuous assessment and semester examination

Bibliographical references:

Manual of HumanAnatomyand Physiology. 2009.Tortora.DeBoeckEditions.Cah.Nutr and Diet. Semester: 5th Semester Teaching Unit : Clinical and Experimental Methodology. Subject title: Epidemiology

Credits: 3 Coefficient: 2

Teaching objectives : Describe what skills the student is expected to have acquired upon successfully completing this subject–maximum 3 lines. Mastery of computer tools-Statistics applied to epidemiology

Recommended prerequisite knowledge : Brief description of the knowledge required to follow this teaching – Maximum 2 lines. Maths – Stat I- Stat II - Computer

Science Subject content:

I: Definition of epidemiology

II:Descriptive epidemiology

-Indicators of the health status of a population : mortality, morbidity, incidence,prevalence Sources of data on the population and its health status

III: Analytical epidemiology

-Risk and risk factors - Statistical association and causality

- Notion of relative riskCase
- -Controlstudies

-Longitudinal and cross-sectional surveys

- -Descriptive and analytical studies Nutritional intervention trials
- -Large-scale nutritional epidemiological studies

IV:Biases in nutritional epidemiology

- -Errors and biases
- -Selection bias
- -Measurement bias

Evaluation method: continuous assessment during class, tutorials, and practical work

References : (Books, course materials, websites, etc.).

Epidemiology without pain. M.Goldber.Ed:Frison-Roche.

Semester: 5th Semster **Teaching Unit :** Clinical and Experimental Methodology.

Subjec ttitle: Bioinformatics

Credits: 4

Coefficient: 2

Teaching objectives: describe what skills the studentis expected to have acquired upon successfully completing this subject – maximum 3 lines. Mastery of computer tools- Applied Statistics

Recommended prerequisite knowledge : brief description of the knowledge required to follow this teaching– Maximum 2 lines. Maths–StatI-StatII-Computer Science

Subject content Computer tools

- -Mastery of Word
- -Mastery of Excel and Power Point
- -Practical use in questionnaire development Data entry
- -Interpretation of results

Evaluation method : continuous assessment during class, tutorials, and practical work

References : (Books, coursematerials, websites, etc.).

Statistical methods for physicians and biologists. D.Schawrtz. Edition Flammarion Médecine Sciences.

Semester:5th Semster Teaching Unit : Applied Language for Nutrition Communication

Subject title: Applied Language for Nutrition Communication Credit:2 Coefficient:2

Teaching objectives: describe what the student is supposed to have acquired as skills after succeeding in this subject - maximum 3 lines. Tounderstand nutrition communication.

Recommended prior knowledge: brief description of theknowledge required to follow this course - maximum 2 lines. Study methods and terminology.

Subjectcontent:

-Understanding nutrition communication
-Approach in nutrition education
-Contribution of social marketing to nutrition communication
-Modifying nutrition communication: Under what conditions?
-Designing interventions in social nutrition communication
-Developing a communication plan
-Implementation and evaluation of social nutrition communication

Assessment mode: continuous assessment in class, tutorials, and practicalwork.

References (books and course materials, websites, etc.).

Semester: 5th Semester Teaching Unit: Scientific English

Subject title:Scientific English Credit:1 Coefficient:1

Teachingobjectives:describe what the student is supposed to have acquired as skills after succeeding in this subject - maximum 3 lines).

Mastery of translation and comprehension of scientific texts and articles in the fields of food, nutrition, and pathologies.

Recommended prior knowledge:brief description of thek knowledge required to follow this course - maximum 2 lines. Study methods and terminology.

Subject content:

- -Consolidation of knowledge in French and English:
- -Studyo f articles in French and English related to food, nutrition, and pathologies
- -Scientific workshops for interpretation and synthesis.

Assessment mode: continuousassessment in class.

References (booksandcoursematerials,websites,etc.).

Recent publications from the laboratory and others.

Semester:6th Semester

Fundamental Teaching Unit1 (UEF3.2.1): Food Safety Subject 1: Food Quality Management

Credits: 4 Coefficient: 2

Teachingobjectives: describe what the student is supposed to haveacquired as skills after succeeding in this subject- maximum 3 lines.

After successfully completing this subject, the student will have the necessary knowledge about the procedures and normative and regulatory aspects for the prevention and preservation of food safety quality.

Recommended prior knowledge : brief description of the knowledge required to follow this coursemaximum 2 lines.

Subject content: Subject 1:Food Quality Management

- 1- Quality tools
- 2- ISO standards studies
- 3- Work and organization reference
 - Good Manufacturing Practices(GMP)
 - Good Laboratory Practices(GLP)
 - Good HygienePractices(GHP)
- 4- Standardization organizations
- 5- Certification, Accreditation, Audit
- 6- Nationalandinternationallegislation

Assessment mode: type of assessment and weighting continuous assessment and semester examination

Bibliographic references

Quality management : Tools and practical applications,ISHIKAWA.Dunod, 2007 Food product quality:Policy, incentives, management and control.Tec& Doc, 1994.

Semestre: 6th Semseter

Fundamental Teaching Unit1 (UEF3.2.1): Food Safety Subject 2: Food Toxicology and Microbiological Safety Credits: 4 Coefficient: 2

Teaching Objectives: describe what the student is expected to have acquired as skills after successfully completing this subject - maximum 3 lines.

After completing this subject, the student will be able to identify the risks associated with food contamination and understand its consequences.

Recommended Prerequisite Knowledge: succinct description of the knowledge required to follow this teaching - maximum 2 lines.

Content of the subject:

I. Microbiological safety of food

1-Principle of food poisoning Bacterial toxicity Mycotoxins

- Microbial groups in food safety
- Microorganismfood associations
- 2-Microbiological control of food

II. Food Toxicology

- -Toxicities and mechanisms of action of toxic substances
- -Study methods
- -Harmful natural substances in food
- -Food additives
- -Metals
- -Alcohols, ketones, peroxides, nitrates, nitrites, nitrosamines
- -Pesticide residues in food
- -Packaging residues in food
- -Prevention and legislation

Assessment Method: continuous assessment and Semester examination

Bibliographic References:

Practical Guide to Toxicology, Reichl Franz-Xavier, DeBoeck, 2004.

Food Microbiology. T.1, Microbiological aspects of food safety and quality, Bourgeois Claude-Marcel, Ed. Tec.etDoc, 1996

Semester :6th Semsester Unit of Fundamental Teaching 1(UFT3.2.2): Behavior and Nutritional Education.

SubjectTitle: Determinants of Food Behavior **Credits**: 4 **Coefficient**: 2

Teaching Objectives : describe what the student is expected to have acquired as skills after successfully completing this subject - maximum 3 lines.

The act of eating is analyzed as a response to the search for balance in both energy and nutrition, as well as psychological and socio-cultural aspects.

Recommended Prerequisite Knowledge: succinct description of the knowledge erequired to follow this teaching - maximum 2 lines. Physiology of major functions-Dietetics-

Contentofthesubject:

- Intro du sti on
- -Introduction
- -Nutrition: a major determinant of health
- -Biological and genetic determinants of food behavior
- -Environmental and socio-economic determinants
- -Sociocultural determinants
- -Psychosocial and emotional determinants
- -Conclusion

AssessmentMethod: continuous assessment during class, tutorials, and practical work

References : (books and course materials, websites, etc.):

Physiological Bases of Food Behavior, Tec & Doc. Cahiers Nutr. and Diet Reviews.Updated database.

Semester:6 Fundamental Teaching Unit1 (UEF3.2.2): Behavior and Nutritional Education Subject: Nutritional Education Credit: 6 Coefficient: 3

Teaching objectives: describe what the student is supposed to have acquired as skills after succeeding in this subject - maximum 3 lines.

Awareness of the link between nutrition and health and the importance of risk factors due to a diet that is too rich and unbalanced.

Recommended prerequisites: brief description of the knowledge required to be able to follow this teaching - Maximum 2 lines. Rational nutrition-Knowledge of foods

Subject content: Chapter I :Nutritional balance 1- Classificationof foods:

-Meat, Fish and Eggs -Milk and Dairy Products -Raw Vegetables and Fruits -Cooked Vegetables and Fruits -Fats & Oily Fruits -Cereals, Starchy Foods & Legumes -Sugar & Sweet Products -Beverages: Water

2- Nutritional equivalences (energetic, protein, calcium)

3- Energy balance

-Total energy intake

-Total energy expenditure

Chapter II: Food ration

-Place of foods in the daily ration: portions and frequencies

-Index of food diversity

- -Elaboration of the food ration
- -Control of the nutritional balance

ChapterIII:

-Food pyramid

-Mediterranean diet: a healthy model

Evaluation mode: continuous assessment during courses, tutorials and practical work **References : (books and lecture notes, websites,etc.).**

Foods, Nutrition, and Health.2nd edition. CFES Research Group.2000

Semester: 6th Semster

Methodology 1 Teaching Unit: Exploration of nutritional status and methods of dietary surveys Subjec ttitle: ExplorationofNutritionalStatus Credits: 4 Coefficient: 2

Teaching objectives: describe what the student is expected to have acquired as skills after successfully completing this subject - maximum 3 lines.

Assessing nutritional status isfundamentalinhumanhealththroughanthropometric, biological, and nutritional tools.

Recommended prior knowledge: concise description of knowledge required to follow this teaching - Maximum 2 lines. Rational nutrition-Bioinformatics

Subject content:

Exploration of nutritional status

-The interview specifying the patient's weight history, nutritional needs, and food intake

- -Clinical examination
- -Anthropometric measurements
- -Methods for assessing biological nutritional status
- -Methods for studying body composition
- -Conclusion

Assessment method: continuous assessment during the course, tutorials, and practical works References (booksandcoursematerials, websites, etc.):

Nutrition Clinical and Metabolism Review Cahiers Nutrition & Dietetics Review

Subject title: Food Survey Methods

Credit: 5 Coefficient: 3

Teaching Objectives: describe what skills the student is expected to have acquired after successfully completing this subject - maximum 3 lines.

To master the tools for conducting food consumption surveys, their areas of application and adaptation, as well as the methods for exploiting their data.

Recommended Prerequisite Knowledge: brief description of the knowledge required to take this course - Maximum 2 lines.

Human Nutrition-Knowledge of food-Bioinformatics-Language applied to nutritional communication

Content of the subject:

ChapterI: Food consumption surveys:

- -Definition
- -When?
- -How?

Chapter2: Methods for collecting data

- 2.1 Survey framework
- 2.2 Practical survey process
- 2.3 Major types of food data collection

Chapter3: Development of food questionnaire

Chapter 4: Treatment of food data

Use of food composition table

Use of computer tools in processing foodcsurveycdata

Chapter 5: Use of biological markers in validating food surveys

Evaluation method: continuous assessment through out the course. Final exam at the end of the semester.

References : (Booksandcoursematerials, websites, etc.).

Souci's composition table, 2000.

Discovery Teaching Unit : Methods for evaluating energy expenditure

Title of th esubject: Methods for evaluating energy expenditure

Credit:1

Coefficient:1

Objectives of the course: describe what the student is supposed to have acquired as skills after successfully completing this subject- maximum 3 lines). Use of energy expenditure questionnaires and methods for data analysis.

Recommended prerequisite knowledge: succinct description of the knowledge required to be able to follow this course - Maximum 2 lines. Bioinformatics-Language applied to nutrition communication

Content of the subject: ChapterI: Reminder on energy metabolism ChapterII: Evaluation of energy expenditure and needs ChapterIII: Physiologica lfactors of energy expenditure -Basal metabolism -Thermoregulationexpenses -Regulation of thermal expenditure

-Regulation of thermal expenditure

-Expenses related to eating behavior

-Expenses related to muscular work

ChapterIV: Measurement of energye xpenditure

-Tools for measuring expenses

Evaluation method: Continuous assessment during the course. Examination at the end of the semester.

References (booksandhandouts,websites,etc.).

Semester : 6th Semester Teaching Unit: Entrepreneurship Subject Title: Entrepreneurship Credit:1 Coefficient:1

TeachingObjectives: describe what the student is expected to have acquired as skills after successful completion of this subject - maximum 3 lines).

-Sufficient knowledge in economics, management, and business administration.

-Learn the basic principles of the business creation process.

-Provide fundamental elements of counseling in the different stages of business creation.

-Different types of financing for a micro-enterprise in Algeria.

-Concreterealization of a business plan and financing file.

SubjectContent

- 1-Types of businesses
- 2-Enterprise integrationintotheproductivesystem.
- 3-Power and decision-making in the company.
- 4-Information in the company.
- 5-Decision-making in the company.
- 6-Company and finance
- 7- Budget policy and monetary policy.
- 8-Modes of financing

Evaluation mode: Continuous assessment in progress. Examination at the end of the semester

Bibliographical references

ZügerRM.2005.Business Management.Basic Concepts I nManagement. Compendio Bildungsmedien AG, 134 p.

Milgrom P,RobertsJ.1997. Economics, Organization and Management. Presses universitaires de