

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

**MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH**

Educational Program

**Common ground
2nd year**

Domain

Natural and Life Sciences

Sector

Agricultural Sciences

الجمهورية الجزائرية الديمقراطية الشعبية

وزارة التعليم العالي و البحث العلمي

البرنامج البيداغوجي
للتعليم القاعدي المشترك
السنة الثانية

ميدان
علوم الطبيعة و الحياة

فرع
العلوم الفلاحية

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I – Half-yearly teaching organization sheet

**Annex to the teaching program for the second year of license Field of
Nature and Life Science “Agronomic Sciences” sector**

Semester 3

Teaching units	Materials	Credits	Coefficients	Hourly volume weekly			VHS (15 weeks)	Other*	Evaluation method			
	Titled			Course	tutorial	PW			CC*	Exam		
Fundamental EU Code: UEF 2.1.1 Credits: 6 Coefficients: 3	Zoology	4	2	1h30	-	1h30	45h	55h	x	40%	x	60%
	Animal Physiology	2	1	1h30	-	-	22h30	27h30	-	-	x	100%
Fundamental EU Code: UEF 2.1.2 Credits: 12 Coefficients: 6	Biochemistry	6	3	3:00 a.m. 1h30	-	-	67h30	82h30	x	40%	x	60%
	Genetic	6	3	3:00 a.m. 1h30	-	-	67h30	82h30	x	40%	x	60%
EU Methodology Code: UEM 2.1.1 Credits: 4 Coefficients: 2	Communication techniques and of Expression (in English)	4	2	1h30	1h30	-	45h	55h	x	40%	x	60%
EU Methodology Code: UEM 2.1.2 Credits: 5 Coefficients: 3	Biophysics	5	3	1h30	1h30	1h00	60h	65h	x	40%	x	60%
EU Discovery Code: UED 2.1.1 Credits: 2 Coefficients: 2	Environment and Sustainable development	2	2	1h30	1h30	-	45h	5h	x	40%	x	60%
Transversal EU Code: UET 2.1.1 Credits: 1 Coefficients: 1	Ethics and Professional Conduct University	1	1	1h30	-	-	22h30	2h30	-	-	x	100%
Total Semester 3		30	17	15h	7h30	2h30	375h00	375h00				

Other* = Additional work in biannual consultation; CC* = Continuous monitoring.

**Annex to the teaching program for the second year of license Field of
Nature and Life Science “Agronomic Sciences” sector**

Semester 4

Teaching units	Materials	Credits		Hourly volume weekly			VHS (15 weeks)	Other*	Evaluation method			
	Titled			Course	Tutorials	PW			CC*		Exam	
Fundamental EU Code: UEF 2.2.1 Credits: 8 Coefficients: 4	Agronomy I	4	2	1h30	1h30	-	45h	55h	x	40%	x	60%
	Agronomy II	4	2	1h30	1h30	-	45h	55:h	x	40%	x	60%
Fundamental EU Code: UEF 2.2.2 Credits: 10 Coefficients: 5	Microbiology	6	3	1h30	1h30	1h30	67h30	82h30	x	40%	x	60%
	Botany	4	2	1h30	-	1h30	45h	55h	x	40%	x	60%
EU Methodology Code: UEM 2.2.1 Credits: 4 Coefficients: 2	Plant Physiology	4	2	1h30	-	1h30	45h	55h	x	40%	x	60%
EU Methodology Code: UEM 2.2.2 Credits: 5 Coefficients: 3	Biostatistics	5	3	1h30	1h30	1h00	60h	65h	x	40%	x	60%
EU Discovery Code: UED 2.2.1 Credits: 2 Coefficients: 2	General ecology	2	2	1h30	1h30	-	45h	5h	x	40%	x	60%
Transversal EU Code: UET 2.2.1 Credits: 1 Coefficients: 1	IT tools	1	1	1h30	-	-	22h30	2h30	-	-	x	100%
Total Semester 4		30	17	12h	7h30.	5h30	375h00	375h00				

Other* = Additional work in biannual consultation; CC* = Continuous monitoring.

II - Detailed program by subject

Semester:3thSemester

EU:Fundamental Teaching Unit 1 Subject 1:

Zoology

Teaching objectives

Knowing the main groups of living organisms on the plans: General architecture, Characteristics (Systematics, Morphology, Anatomy, reproduction, Ecology), constraints, adaptations, and evolution. Particular importance will be given to updating the classification and to zoological groups of agricultural, medical, veterinary, fisheries or environmental interest.

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

The student should have an idea about the different classes of the animal kingdom.

Content of the subject

1. Presentation of the animal kingdom

1.1. Basics of classification

1.2. Zoological nomenclature

1.3. Evolution and phylogeny

1.4. Numerical importance of the Animal kingdom

2. Sub-kingdom of Protozoa

2.1. General information on protozoa.

2.2. Classification

2.2.1. Phylum Sarcomastigophora

2.2.2. Phylum Ciliophora

2.2.3. Phylum Apicomplexa

2.2.4. Phylum Cnidosporidia

3. Sub-kingdom of the Metazoa

3.1. Phylum Spongiaria

3.2. Phylum Cnidarians

3.3. Ctenary Branch

3.4. Platyhelminthes branch:

3.5. Phylum Nematelminthes.

3.6. Phylum Annelida

3.7. Phylum Molluscs

3.8. Phylum Arthropods

3.9. Phylum Echinodermata

3.10. Phylum Chordates

Practical work

TP No. 1: Study of some typical species of Protozoa: *Trypanosoma rhodesiense*, *Leishmania major*, *Leishmania infantum*, *Trypanosoma gambiense*, *Entamoeba histolytica*, *Paramecium sp.*

TP No. 2: Study of some typical Platyhelminth species: *Moniezia expansa*, *Taenia hydatigena*, *Taenia pisiformis*, *Fasciola hepatica*.

TP No. 3: Study of some typical Annelid species: *Lumbricus terrestris*, *Hirudo officinalis*.

TP No. 4: Study of some typical species of Arthropods: Crustaceans (King shrimp, Squill, biramous morphology and appendages), Chelicerates (Scorpion), Insects (Locust, Bee).

TP No. 5: Study of the mouthparts of insects: The different oral apparatus and adaptation to diets, grinding type mouthparts (Orthoptera, Locust).

TP No. 6: Study of some typical species of Echinoderms: Echinids (Urchin), Asterids (Starfish).

TP No. 7: Study of some typical species of Vertebrates: Fish (Carp), Birds (Pigeon), Mammals (Rat, Mouse)

Film screening

- Turtles.
- The birds
- Amphibians.

Evaluation method

Continuous monitoring and half-yearly review

References

1. ARAB A., CHERBI M., KHERBOUCHE-ABROUS O., Amine F., BIDI AKLI S., HADDOU SANOUN G., 2013: Zoology Volume 1. Handout, Works and University Publications. Algeria. 152 p.

2. ARAB A., CHERBI M., KHERBOUCHE-ABROUS O., Amine F., BIDI AKLI S., HADDOU SANOUN G., 2013: Zoology Volume 2: Practical Work. Handout, University Works and Publications. Algeria. 224 pp.

Semester:3thSemester

EU:Fundamental Teaching Unit 1 Subject 2:

Animal Physiology

Teaching objectives

At the end of this course, students will have acquired the basic notions of animal physiology and the strategies used in the animal world to respond to the physical and chemical constraints of the environment.

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

The student must have knowledge of cellular physiology.

Content of the subject

1. Invertebrates.

1.1. Circulatory system and circulation of hemolymph.

1.2. Respiration in Invertebrates.

1.3. Nutrition in Invertebrates.

1.4. Excretion in Invertebrates.

1.5. Nervous system of invertebrates.

2. Vertebrates

2.1. Physiology of the endocrine glands

2.2. The body's fluid compartments

2.3. Breathing

2.4. Blood flow

2.5. Renal Excretion

2.6. The digestion

2.7. Thermoregulation

Evaluation method

Half-yearly review

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

1- Lamb JF, 1990-Textbook of physiology. Ed. Elsevier Masson, Paris, 480p.

2- Chevalet P. and Richard D., 1999-The notion of regulation in physiology. Ed. Nathan, Paris, 128p.

3- Couée I., Fontaine-Poitou L. and Guillaume V., 2010-Cellular and molecular biology and physiology: Transmission of knowledge and preparation for competitive exams. Ed. De Boeck.

4- Gilles R., 2006-Animal physiology. Ed. De Boeck.

Semester:3thSemester

EU:Fundamental Teaching Unit 2 Subject 1:

Biochemistry

Teaching objectives

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

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

The student must have certain notions about chemical bonds (weak and strong) and the physicochemical properties of organic molecules.

Content of the subject

1. Chemical bonds

1.1. Strong bonds

1.2. Weak bonds

2. Structure and physicochemical properties of carbohydrates

2.1. Simple dares

2.2. Oligosides

2.3. Polysaccharides, glycosides.

3. Structure and physicochemical properties of lipids

3.1. Simple lipids

3.2. Complex lipids

4. Structure and physicochemical 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. Enzymology concepts

5.1. Definition, classification

5.2. Mechanisms of action

- 5.3. Active site
- 5.4. Enzyme kinetics and types of representation
- 5.5. Enzyme inhibition
- 5.6. Allosteric phenomenon
- 6. Notions 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 glycogenogenesis)
 - 7.3. Regulation
- 8. Lipid metabolism
 - 8.1. Catabolism of fatty acids (Beta-oxidation)
 - 8.2. Sterol catabolism
 - 8.3. Biosynthesis of fatty acids and triglycerides
 - 8.4. Sterol biosynthesis
 - 8.5. Regulation
- 9. Peptide and protein metabolism
 - 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

Evaluation method

Continuous monitoring and half-yearly review

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

1. Cathérine Baratti-Elbaz and Pierre Le Maréchal, 2015- Biochemistry. Dunod, Paris, 160p.
2. Norbert Latruffe, Françoise Bleicher-Bardelett, Bertrand DucloS and Joseph Vamecq, 2014- Biochemistry. Dunod, Paris.
3. Serge Weinman and Pierre Méhul, All Biochemistry. Dunod, Paris, 464p.
4. Françoise Lafont and Christian Plas, 2013- Biochemistry exercises. Ed. Doin, Paris, 410p.

Semester:3thSemester

**EU:Fundamental Teaching Unit 2 Subject 2:
Genetic**

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 mechanisms of regulation of gene expression.

Recommended prior knowledge*(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. Genetic 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. Concepts of extra-chromosomal genetics
- 12. Concept of population genetics

Tutorials:

TD No. 1: Genetic material

TD No. 2: Character transmission

TD No. 3: Mono and di hybridism (Special cases)

TD No. 3: Related genes TD No. 4: Genetic maps

TD No. 5: Protein synthesis (Genetic code)

TD No. 6: Fine structure of the gene (intragenic recombination) TD No. 7: Conjugation and factor map TD

No. 8: Population genetics TD No. 9: DNA extraction TD No.

10: DNA assay TD No. 11: BARR corpuscle

Evaluation method

Continuous monitoring and half-yearly review

References

- 1- Pasternak JJ, 2003-Human molecular genetics. Ed. De Boek, 522 p.
- 2- Harry M., 2008-Molecular and evolutionary genetics. Ed. Maloine.
- 3- Watson J., Baker T., Bell S., Gann A., Levine M. and Losick R., 2010- Molecular biology of the gene. Pearson.
4. Henry JP and Gouyon PH, 2003- Summary of Population Genetics. Ed. Dunod.

Semester:3thSemester

EU:Methodological Teaching Unit

Subject 1:Communication and Expression Techniques (in English)

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 written format (report, oral, defense). Application of English grammar in a scientific context.

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

Some 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 for writing scientific reports.**

Evaluation method

Continuous monitoring and half-yearly review

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

Research article.

Semester:3thSemester

EU:Methodological Teaching Unit 2 Matter:

Biophysics

Teaching objectives

The general objective of teaching the biophysics course is to enable SNV students to acquire the basics of physics.

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

Content of matter I.

States of matter

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

I.2. Liquids: water structure, 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: mole fraction, molarity, molality, weight concentration, 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 and viscosity measurements 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 3 practical work at least)

Practical work No. 1:Surface tension TP No. 2:

Conductometric titration TP No. 3:Titration by PH

meter TP No. 4:Viscosity measurement TP No. 5:

Spectrophotometer TP No. 6:Refractometer

Evaluation method

Continuous assessments (presentation + test) and half-yearly examination.

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

- F. Grémy and J. Perin. Elements of Biophysics. Volume 1 and 2. Flammarion. Paris.
- C. Bénézech and J. Llory. Physics and Biophysics. Masson and Co. Paris, 1973.
- Y.THOMAS, 2000, Biophysics for the use of students in biological sciences, Bréal, Paris.

- A. Bertrand, D. Ducassou and JC. Healey. Biophysics. Medical use of radiation – Vision – Hearing.

Semester:3thSemester

EU:Discovery Teaching Unit

Subject 1: Environment and Sustainable Development

Teaching objectives

This teaching aims to raise students' awareness of the issues, content and actions of sustainable development. It is about making them aware that it is possible to act to preserve the environment, through their training, as well as on their scale, on their consumption, their daily activities and their society. During their university education, whatever their specialty and their ambition for their future professional orientations, the student will have the opportunity to learn and experiment with their knowledge of sustainable development.

Sustainable Development is currently one of the responses emerging throughout the world to address the current conjunction of the world's major ecological, economic and societal challenges.

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

Without 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. Areas of sustainable development

2.5. The principles of SD 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 lower product (economic) and boys/girls school enrollment rate (societal), accessibility to care (societal).

**2.7. Environmental education, nature awareness and animation,
environmental communication,**

Program for personal work

1-Identify examples in the press (international and national) illustrating the principles of sustainable development (precaution, responsibility for example). Presentation and debate. 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 implementing preservation, conservation or restoration of environments

Evaluation method

Continuous monitoring and half-yearly review

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

Semester:3thSemester

**EU:Transversal Teaching Unit Matter:Ethics
and Academic Deontology**

Teaching objectives

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

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

Content of the subject

Content of the subject

1. INTRODUCTION:Contexts of the Algerian universityienne

2. CONCEPTS

2.1 Morale

2.2 Ethics

2.3 Ethics

2.4 Law

2.5 Professional values

2.6 Learning and teaching

2.7 Didactics and pedagogy

3.THE CHARTER OF ETHICS AND UNIVERSITY DEONTOLOGYE

3.1 Fundamentals

3.2 Rights

3.3 Obligations and duties

4. APPS

4.1 Teaching: courses, assessment of knowledge andbehavior

4.2 Scientific research:research methodology, Plagiarism,
copyright, scientific writing.....

Evaluation method

Half-yearly review

References

- Bergadaà, M., Dell'Ambrogio, P., Falquet, G., Mc Adam, D., Peraya, D., & Scariati, R. (2008). The ethics-plagiarism relationship in the completion of personal work by students.
- Charter of university ethics and professional conduct, Algiers, May 2010www.mesrs.dz Gilbert
- [Tsafak](#) , Ethics and professional conduct in education [Educational Sciences Collection African University Press, 1998](#)
- Gohier, C., & Jeffrey, D. (2005). *Teaching and training in ethics*. Laval University Press. Jaunait,
- A. (2010). Ethics, morals and professional conduct. *Pocket-Ethical Space*, 107-120.

Semester:4thSemester

EU:Fundamental Teaching Unit 1 Subject 1:

Agronomy I (Water, Soil)

Teaching objectives

The student must know the concepts and terminology of water and different soils, methods of study and analysis in correlation with different ecosystems.

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

No prerequisites

Content of the subject

1. Introduction

- Definition of soil and
- Role of water in Soil Sciences

A- The Ground

2.Constitutive elements of the soil

- Mineral constituents
- Organic constituents
- Colloidal complexes

3.Morphological organization of soils

- Elementary organizations
- Soil horizon
- Soil profiles
- Soil coverage
- Soil and water
- Soil atmosphere
- Soil temperature
- Floor color

4.Chemical and biological properties of soil

- Ion exchange phenomena
- Electro-ionic properties of soil

- Soil organisms
- Transformations of microbial

origin 5. Soil classification (Notions)

- The different classifications (Russian, American, French)
- Overview of Algerian soils and their relationships with climate and geomorphology.

B- Water

- Role of soil water.
- Relations between the three phases of the soil.
- Measurement of the volumes occupied by the different phases of the soil.
- The forms of water in the ground.
- The forces of water retention by the soil.
- The states of water in the soil.
- The water potential in the soil.
- Water movements in the ground.
- Water balance in the soil.
- Water requirements of plants.

Tutorials :

TD No. 1: Relations between the units of measurement used in soil sciences (Reminder and exercises on methods for preparing analysis solutions; unit conversion exercise).

TD No. 2: Exercises on the physical aspect of the ground (three-phase system)

TD No. 3: Slide projection session (the different soils of the CPCS and USDA classifications).

Evaluation method

Continuous monitoring and half-yearly review

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

1. LIM H., 1982- Modern agronomy. Physiological and agronomic basis of plant production. Ed. Masson.

2. DUCHAUFOR P., 1994- Pedology, soil, vegetation, environment. Ed. Masson.

3. BLONDEL J., 1979- Biogeography and ecology. Ed. Masson.

Semester:4thSemester

EU:Fundamental Teaching Unit 1 Subject 2:

Agronomy II (Plants, Animals)

Teaching objectives

The lessons on the animal part provided in this part aim to give students the necessary bases to master the nutrition and feeding of animals. Also, at the end of the module, students must be able to:

- know the modalities and efficiency of food digestion
- know the fate of the main nutrients within the animal body: water, carbohydrates, lipids, proteins, minerals including trace elements, vitamins.
- know the origin of the different needs of animals, the importance of covering them through the general consequences of imbalances, and their units of expression.

- know the methods for calculating the nutritional value of food for the main domestic animals.

Those in the plant section aim to provide students with the basics common to all plant production.

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

No prerequisites

Content of the subject

It is very desirable that this subject be taught by two teams or two teachers, a plant scientist for part 1 and a zootechnician for part 2.

Part 1: Animal

1. Use and constitution of foods

has. Concept of food and nutrition

b. Comparative anatomy of the digestive system

2. Digestive actions of different animal species

has. In ruminants-

b. At the hen's

vs. At the rabbit

3. Energy supply

has. Importance

b. Dietary requirements

vs. Effects of nutritional deficiency or excess

4. Nitrogen feeding

has. Importance

b. Dietary requirements

vs. Effects of nutritional deficiency or excess

5. Mineral and vitamin diet

has. Importance

b. Dietary requirements

vs. Effects of nutritional deficiency or excess

Tutorials

TD No. 1: Characterization of livestock feed (grains and concentrated feeds-cakes-protein crops-fodder and preservation methods)

TD No. 2: Principle of animal rationing (dairy, growing and fattening)

Part 2: Vegetable

1. The agricultural plant

has. Relationships between cultivated plants: rotation and crop rotation

b. Seeds: (Classification, Morphology and physiology, Qualities of a good seed, Seed preparation

vs. The vegetation cycle of a plant: (the main stages of vegetation: germination - active growth - flowering - fruiting - maturation.)

d. The crop cycle

e. Nutrient associations “plant – microflora”

2. The plant grown in its environment

has. The management of a culture.

b. The yield of a crop and its components

vs. Soil preparation

d. Setting up the culture

3. The main cultural care

has. fertilization

b. the fight against weeds-

vs. combating crop pests

4. The harvest

5. Fertilization

has. General notions

b. The amendments

vs. Mineral fertilizers.

Evaluation method

Continuous monitoring and half-yearly review

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

1. Dominique Soltner, 2015- Guide to the new agriculture. Ed. Agricultural Sciences and Techniques, 120p.

2. JM Meynard, A. Messéan and coordinators, 2014- Crop diversification. Ed. Quae, 103p.

3. Martine and Yannick Crosier, 2014- Animal nutrition. Ed. Educagri, 110

Semester:4thSemester

EU:Fundamental Teaching Unit 2 Subject 1:

Microbiology

Objective of teaching

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

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

The student must have a general understanding 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. Cellular 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. Germination3.

3. Bacterial classification

3.1. Phenetic classification

3.2. Phylogenetic classification

3.3. Bergey classification

4. Bacterial nutrition

4.1. Basic needs

4.2. Growth factors

4.3. Trophic types

4.4. Physico-chemical parameters (temperature, pH, O₂ and aW)

5. Bacterial Growth

5.1. Measuring growth

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 :

TP No. 1:Introduction to the microbiology laboratory

TP No. 2:Method of studying microorganisms and the different sterilization processes TP

No. 3:Seeding methods;

TP No. 4:Microscopic study of bacteria, simple staining

TP No. 5:Morphological study of different bacterial colonies on culture medium TP No.

6:Gram staining TP No. 7:Culture media

TP No. 8:Study of bacterial growth

TP No. 9:Criteria for biochemical identification of bacteria TP

No. 10:Yeasts and cyanobacteria

TP No. 11:Growth inhibitors, antibiogram

TP No. 12:Isolation of the total and specific flora of certain products (water, milk, etc.).

Evaluation method

Continuous monitoring and half-yearly review

References

1.Henri Leclerc, Jean-Louis Gaillard and Michel Simonet, 1999- General microbiology. Ed. Doin, Paris, 535p.

2.Jerome Perry, James Staley and Stephen Lory, 2004- Microbiology-Lecture and review questions. Dunod, Paris, 889p.

3. Jean-Pierre Dedet, 2007- Microbiology, from its origins to emerging diseases. Dunod, Paris, 262p.

Semester:4thSemester

EU:Fundamental Teaching Unit 2 Subject 2:

Botany

Educational objectives of the course

This subject aims to provide an introduction to the classification and anatomical characterization of the major groups of the plant kingdom. The teaching provided also attempts to provide students with the methods of reproduction.

Recommended prior knowledge

The student must have knowledge of plant biology (morphology, anatomy, physiology).

Content of the subject

Introduction to botany

- Definitions, notions and classification criteria. Systematics of the major groups of the “plant” kingdom

FIRST PART: Algae and Fungi 1. Algae

1.1. Prokaryotic Algae (Cyanophytes / Cyanobacteria)

1.2. Eukaryotic algae

1.2.1. Morphology

1.2.2. Cytology

1.2.3. Reproduction (concept of range, development cycle)

1.3. Systematics and particularities of the main groups

1.3.1. Glaucophyta

1.3.2. Rhodophyta

1.3.3. Chlorophyta and Streptophyta

1.3.4. Haptophyta, Ochrophyta, Dinophyta, Euglenozoa, Cryptophyta, Cercozoa

2. Mushrooms and lichens

2.1. Problems in classifying fungi

2.2. Structure of thalli (mycelia, stroma, sclerotium)

2.3. Reproduction

2.4. Systematics and particularities of the main groups of mushrooms

2.4.1. Myxomycota

2.4.2. The Oomycota

2.4.3. Eumycota (Chytridiomycota, Zygomycota, Glomeromycota, Ascomycota, Basidiomycota)

2.5. A particular algae-fungus association: lichens

2.5.1. Morphology

2.5.2. Anatomy

2.5.3. Reproduction

PART TWO: Embryophytes

1. Bryophytes: Morphology and reproduction of the different branches

1.1. Marchantiophytes

1.2. Anthocerotophytes

1.3. Bryophytes *s. str.*

2. Pteridophytes: Morphology and reproduction of the different branches

2.1. Lycophytes

2.2. Sphenophytes (= Equisetines)

2.3. Filicophytes

3. Gymnosperms sensu lato

3.1. Cycadophytes: concept of ovule

3.2. Ginkgophytes

3.3. Coniferophytes: concept of flower, inflorescence and seed

3.4. Gnetophytes: pivotal group

4. Angiosperms

4.1. Vegetative system and concept of morphogenesis: growth of stems, leaves and roots

4.2. Floral morphology (organization of the flower, inflorescences)

4.3. Floral biology: microsporogenesis and macrosporogenesis

4.4. Seeds and fruits

4.5. Concept of modern systematics, cladogenesis and main taxa. Presentation of classifications (Engler 1924, APG II)

Practical work(3 weekly): TP No. 1.

Algae (Phycophytes)

Morphology and reproduction of some species such as *Ulva lactuca* And *Cystoseira mediterranea*.

TP No. 2. Mushrooms (Fungi)

Morphology and reproduction of *Rhizopus nigricans* (Zygomycetes), *Agaricus campestris* (Basidiomycetes)

TP No. 3. Lichens

Morphology of different types of lichens and study of *Xanthoria parietina*

TP No. 4. Bryophytes

Morphology and reproduction of *Bryum* sp. TP

No. 5. Pteridophytes

Morphology and reproduction of *Polypodium vulgare* and of *Selaginella denticulata*

TP No. 6. Cycadophytes

Morphology and reproduction of *Cycas revoluta* TP No.

7. Coniferophytes (Gymnosperms *sensu stricto*)

Morphology and reproduction of *Pinus halepensis* And *Cupressus sempervirens* TP N°8 and 9: Angiosperms Monocots and Eudicotyledons.

Illustration of the concept of trimery and pentamery, of the concept of actinomorphy and zygomorphy; dialypetal, gamopetal, hypogynous flower, epigynous flower... .

TP No. 8. Floral morphology of Angiosperms Monocotyledons on examples as *Asphodelus* (Or *Allium*)

TP No. 9. Floral morphology of Angiosperms Eudicotyledon on examples like *Lathyrus* Or *Vicia*

TP No. 10. Sexual reproduction in angiosperms

Pollen grain, pollination and fertilization in angiosperms

Fruit types and seed types.

Evaluation method

Continuous monitoring and half-yearly review

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

1. APG II. 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Bot. J. Linnean Society* 141:399–436.

2. APG III. 2009. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. *Bot. J. Linnean Society* 161:105–121.
3. Lecointre G. and Le Guyader H. 2001. Phylogenetic classification of living things. Ed. Belin.
4. Reviers de B. 2002. Biology and Phylogeny of Algae. Volume 1 and 2. Ed. Belin.
5. Meyer S., Reeb C. and Bosdeveix R. 2004. Botany: Plant biology and physiology. Ed. Maloine.
6. Dupont F., Guignard JL 2012. Botany Plant families. Elsevier-Masson

Semester:3thSemester

EU:Methodological Teaching Unit 1 Matter :

Plant Physiology

Teaching objectives

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

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

The student must master notions of 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

2.Water nutrition (mechanism of water absorption and transit)

3.Sweating and fluid balance

3.1. Highlighting

3.2. Location and measurement

3.3. Change in sweating

3.3.1. influence of plant morphology

3.3.2.influence of environmental factors

3.4. Physiological determinism of sweating

3.5.Water balance of plants

3.6. Benefit of transpiration for plants

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

Part 2: Development

1. Seed formation
2. Germination
3. Growth
4. Flowering
5. Fruiting

Practical work

HAS. Water nutrition

TP No. 1: Osmolarity

(spectrophotometry) TP No. 2: Sweat TP

No. 3: Stomata

b. Mineral nutrition

TP No. 4: Growth of bean seedlings in different nutrient solutions

vs. Nitrogen nutrition

TP No. 5: Total protein electrophoresis TP

No. 6: Breathing

TP No. 7: Separation of pigments by chromatography

D. Growth

TP No. 8: Growth of seedlings in different solutions TP

No. 9: Tropisms

TP No. 10: Grain germination

Evaluation method

Continuous monitoring and half-yearly review

References

- 1- Béraud J., 2001-The biological analysis technician. Theoretical and practical guide. Ed. Tec et Doc, Paris, 208p.
- 2- Dupont G., Zonszain F. and Audigié C., 1999-Principles of biochemical analysis methods. Ed. Doin, Paris, 207p.
- 3- Burgot G., Burgot JL, 2002-Instrumental methods of chemical analysis and applications: Chromatographic methods, electrophoresis and spectral methods. Ed. Tec et Doc, Paris, 306p. 4- Heller R., Esnault R. and Lance C., 2005-Plant Physiology: Volume 1, Nutrition. Ed. Dunod, Paris, 209 p. B004N6JXL4
- 5- Morot-Gaudry JF, Moreau F. and Prat R., 2009-Plant biology: Nutrition and metabolism. Dunod, Paris, 224p.

Semester:4thSemester

EU:Methodological Teaching Unit 2 Matter :

Bio Statistics

Objective of teaching

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

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

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

Subject content 1.

Reminders

1.1. Reminders on descriptive statistics

1.1.1. Position parameters

1.1.2. Dispersion parameters

1.1.3. Shape settings

2. Reminders on the main distribution laws:laws: 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. Testing significance of correlation

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 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

Evaluation method

Continuous monitoring and half-yearly review

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

1. BENZEON JP, 1984- Data analysis. Ed. Bordas, Volumes I and II.

2. HUET S., JOLIVET E. and MESSEON A., 1992- Nonlinear regression: methods and applications in biology. Ed. INRA.

3. TROUDE C., LENOUR R. and PASSOUANT M., 1993- Statistical methods under Lisa - multi-varied statistics. CIRAD-SAR, Paris, PP: 69-160.

Semester:4thSemester

EU:Discovery Teaching Unit Matter :

General ecology

Objective of teaching

The objective of the subject is to help students understand the concept of ecosystem, abiotic and biotic factors and the interactions between these factors, the components of the ecosystem and its functioning.

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

No prerequisites

Content of the Subject

Chapter I

- 1.1. Definition of the ecosystem and its constituents (Notions of biocenosis and ecological factor.)
- 1.2. Areas of intervention

Chapter II: Environmental Factors

2.1. Abiotic factors

- 2.1. Climate
- 2.2. Edaphic
- 2.3. Water

2.2. Biotic factors

- 2.2.1. Competitions
- 2.2.2. Pests and Predators
- 2.2.3. Interaction of cooperation and symbiosis
- 2.2.4. Parasitism

2.3. Interaction of environments and living beings

- 2.3.1. Role of ecological factors in population regulation
- 2.3.2. Concept of ecological optimum
- 2.3.3. Ecological Valencia
- 2.3.4. Ecological niche.

Chapter III: Structure of ecosystems

- 3.1. Structure of food chains; relationships between producers (autotrophs) and their dependence on nutrients and light or chemical energy.**
- 3.2. Consumers (Heterotrophs) who are linked to producers and finally the decomposers who ensure the recycling and mineralization of organic matter.**

Chapter IV: Functioning of ecosystems

- 4.1. Energy flow at the level of the biosphere:**
- 4.2. Concepts of ecological pyramids, production, productivity and bioenergy yield**

- 4.3. Circulation of matter in ecosystems and main bio-geochemical cycles**

- 4.4. Influence of human activities on biological balances and particularly on the disruption of bio-geochemical cycles (consequences of pollution of aquatic environments and atmospheric pollution (eutrophication, greenhouse effect, ozone, acid rain.))**

Chapter V: Summary description of the main ecosystems

- 5.1. Forest, meadow, surface water, ocean**
- 5.2. Evolution of ecosystems and notion of climax**

Tutorials :

The supervised work concerns the methods applied for the study of the environment.

Evaluation method

Continuous monitoring and half-yearly review

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

- 1.DAJET P. and GORDAN M., 1982- Frequency analysis of the ecology of the species in communities. Ed. Masson.**
- 2.RAMADE F., 1984- Elements of ecology: Fundamental ecology. Ed. McGraw-Hill.**

Semester:4thSemester

EU:Transversal Teaching Unit Subject:

IT tools

Objective of teaching

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

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

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Content of Matter

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. Designing a presentation with
- Powerpoint. Introduction to Latex.
-

II. Software and algorithms

- Definition of software. Definition of
- algorithmic. use of algorithms in
- biology.

Evaluation method:

Half-yearly review

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

**MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH**

Compliance framework

**TRAINING OFFER
LMD**

ACADEMIC LICENSE

2014 - 2015

ESTABLISHMENT	FACULTY / INSTITUTE	DEPARTMENT
MOHAMMED KHIDER BISKRA UNIVERSITY	FACULTY OF EXACT SCIENCES SCIENCE OF LIFE AND NATURE	AGRICULTURAL SCIENCES

DOMAIN	SECTOR	SPECIALITY
SCIENCE OF NATURE AND LIFE	AGRONOMY	SOILS AND WATERS

الجمهورية الجزائرية الديمقراطية الشعبية

وزارة التعليم العالي و البحث العلمي

نموذج مطابقة

عرض تكوين

ل.م.د

ليسانس أكاديمية

2014-2015

القسم	الكلية/ المعهد	المؤسسة
العلوم الزراعية	كلية العلوم الدقيقة و علوم الطبيعة و الحياة	جامعة محمد خيضر بسكرة

التخصص	الفرع	الميدان
التربة والمياه	العلوم الزراعية	علوم الطبيعة و الحياة

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---p**

I – License identity sheet

1 - Location of the training:

Establishment: University of Biskra

Faculty or Institute: Faculty of Exact Sciences Science of Life and Nature

Department: Agricultural Sciences

Field: Science of Nature and Life

Sectors/specialties: AGRONOMY

:

References to the license authorization order (attach copy of the order)

2- External partners

- partner establishments:

CRSTRA--ITDAS--DSA--INPV—INRAA - universities

- businesses and other socio-economic partners:

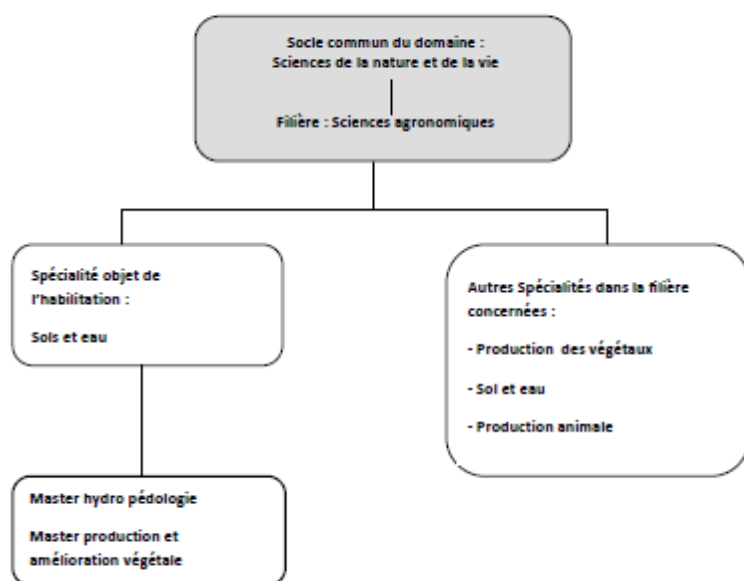
Farmers-EAC- EAI- DGF-CRSTRA--ITDAS--DSA--INPV-INRA-CRBt-ITGC- universities...;

Date packaging units, flour mills

- International partners: Universities and research institutes, CIRAD FRANCE. University of RENNE; university PADUA ITALY

3 – Context and objectives of the training

A – General organization of training: project position



B - Training objectives

The main educational objectives of this training are to provide students with a solid scientific and technical approach and knowledge to approach the field of soil sciences and agricultural hydraulics. The skills acquired must allow them to innovate and adapt to different major and minor conditions encountered in the field.

Based on solid scientific approaches, this training ensures that students acquire as much data as possible which allows them to confront the constraints of our soils through targeted solutions (amendments, crop rotation, DRS, etc.) and adapted as they go. irrigation needs based on the potential in terms of quality and quantity of water available to it.

In addition to the different categories included in this training, this license ensures the training of students in machinery, irrigation, agropedology and fertilization, etc. The means which further strengthen this training are mainly field resources, laboratory resources and organized educational outings.

C – Profiles and targeted skills

Through this training we aim to make a contribution to a better edaphic and hydraulic knowledge of the rural environment. This training will allow students to strengthen university research in this area.

This training will also allow the establishment of a generation of experts capable of operating close to the agricultural world by providing analysis laboratories in order to carry out diagnostics at an affordable cost.

The aim is to train graduates capable of working in soil and water analysis laboratories in both the public and private sectors.

Furthermore, the entire financial sector will have experts in agricultural land on hand, feasibility studies and expertise in the agricultural field.

On the other hand, design offices operating in this field will be able to find qualified technicians to cover this shortage in the analysis laboratories.

D – Regional and national employability potential(Required Field)

1-Ministries and local and central public administrations:

Institutions under the supervision of the Ministry of Agriculture DSA, INPV, DGF,

Technical institutes to conduct applied research

National parks, nature reserves, botanical gardens...

Local institutions like nurseries and APCs

2-Small and medium-sized private and public companies working in the field of agriculture:

Studies, consultancy and expertise offices in the fields of agriculture; livestock and forestry;

Company for creating green spaces and reforestation and forest management company;

Agricultural products marketing company

Companies processing and marketing local agricultural products;

Business, processing (oil, concentrates, fruit juices, jams, etc.),

3-Recruitment in Training and Professional Development Centers;

4- Access to university structures, research centers, research units and laboratories (INRAA; CRSTRA; .INRF.....).

E – Gateways to other specialties

Access to the academic license in soil and water is open to holders of a valid baccalaureate. After six semesters of theoretical and practical courses, candidates will be able to address the issue of

agricultural sustainability through mastery of different production techniques while respecting the environment.

Graduates at the end of this training will have fairly broad skills in line with all the know-how required for sustainable agriculture.

The fundamental knowledge acquired during the preparation of the license allows candidates to apply to national and international universities, for mobility with a view to preparing academic and professional Masters I and II in the following fields:

- Pedology
- Agricultural hydraulics
- Plant production and improvement
- Plant ecology;
- Agri-food and valorization of agricultural products and by-products
- Plant protection;
- Access to laboratories and university research organizations for the preparation of Doctorates in the fields of plant ecology and agricultural sciences, biology;

Of course, this type of training is granted with funding in the form of scholarships within the framework of the new provisions of the doctoral student status.

F – Performance indicators expected from training(

Through this training we aim to make a contribution to a better knowledge of soil and water resources in rural areas. This training will allow students to strengthen university research in this area.

This training will also allow the establishment of a generation of experts capable of operating close to the agricultural world by providing analysis laboratories in order to carry out diagnostics at an affordable cost.

The aim is to train graduates capable of working in soil and water analysis laboratories in both the public and private sectors.

Furthermore, the entire financial sector will have experts in agricultural land on hand, feasibility studies and expertise in the agricultural field.

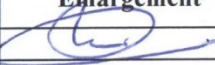
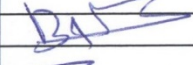
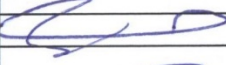


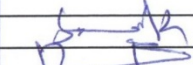

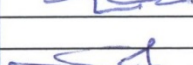




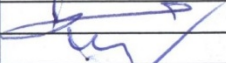
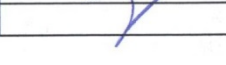
On the other hand, design offices operating in this field will be able to find qualified technicians to cover this shortage in the analysis laboratories.

4 – Human resources available

A: Supervisory capacity(expressed in number of students that can be supported):

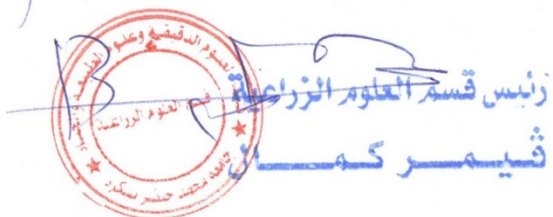
Number of teachers	Number of students to support
39	40

B: Internal teaching team mobilized for the specialty:(to be informed and endorsed by the faculty or institute)

Nom, prénom	Diplôme graduation	Diplôme de spécialité (Magister, doctorat)	Grade	Nature de l'intervention	Emargement
Belhamra Mohammed	Ingénieur agronome	Doctorat	PR	Cours, TD, TP, encadrement	
Benaziza Abdelaziz	Ingénieur agronome	Doctorat	MCA	Cours, TD, TP, encadrement	
TARAI Nacer	Ingénieur agronome	Doctorat	MCA	Cours, TD, TP, encadrement	
Achoura Ammar	Ingénieur agronome	Doctorat	MCB	Cours, TD, TP, encadrement	
Benziouche S. Eddine	Ingénieur agronome	Doctorat	MCA	Cours, TD, TP, encadrement	
Deghnouche Kahramen	Docteur vétérinaire	Doctorat	MCA	Cours, TD, TP, encadrement	
Masmoudi Ali	Ingénieur agronome	Doctorat	MCA	Cours, TD, TP, encadrement	
Allache Farid	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Bechar Med-Farouk	Microbiologie	Magister	MAA	Cours, TD, TP, encadrement	
Bedjaoui Hanane	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Benaissa Kelthoum	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Boukhalifa Hassina	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Boukehil Khaled	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Boumaraf Belkacem	Ingénieur agronome	Doctorat	MCB	Cours, TD, TP, encadrement	
Demnati Fatma	Ingénieur agronome	Doctorat	MCB	Cours, TD, TP, encadrement	
Dendouga Wassila	Biologie végétale	Magister	MAA	Cours, TD, TP, encadrement	
Djekiref Laâla	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Djerah Abdelghani	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Drouai Hakim	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Farhi Kamilia	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Guimeur Kamel	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Hammou Faiza	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Hiouani Fatima	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Kessai Abla	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Khechai Salim	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Mebrek Naima	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Mehaoua Med-Seghir	Ingénieur agronome	Doctorat	MCB	Cours, TD, TP, encadrement	
Melakhessou Zohra	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Messai Ahmed	Docteur vétérinaire	Doctorat	MCB	Cours, TD, TP, encadrement	

Messak Med Ridha	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Mezerdi Farid	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Nefouci Fatima	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Razi Sabah	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Redouane Salah Sara	Biologie végétale	Magister	MAA	Cours, TD, TP, encadrement	
Saadi Inesse	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Saighi Saida	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Hadjeb Ayoub	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Hicher Azzadine	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	
Lamrani Cherifa	Ingénieur agronome	Magister	MAA	Cours, TD, TP, encadrement	

f) Visa du département



Visa de la faculté ou de l'institut



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

Grade	Internal Workforce	External Workforce	Total
Professors	1	0	1
Lecturers (A)	5	0	5
Lecturers (B)	5	0	5
Assistant (A)	28	0	28
Assistant r (B)	0	0	0
Other (*)	0	0	0
Total	39		39

(*) Technical and support staff

5 – Material resources specific to the specialty

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

Laboratory title: Soil Physics Laboratory

Student capacity: 30

N o.	DESIGNATION	Qty
1	Orbital shaker	02
2	Mechanical stirrer	01
3	Multi-parameter field analyzer (pH, conductivity, oximeter)	01
4	Apparatus from Casa Grande	01
5	Camera	01
6	Sand bath 06l	01
7	Water bath	04
8	Electronic scale with internal calibration, range 150g/65g	02
9	Compass	01
10	Munsell Charter	01
11	Digital stopwatch	05
12	Clinometer	01
13	Membrane hydrometer	01
14	Universal oven	04
15	Ceramic plate extractor; Richard's device	01
16	Muffle furnace	01
17	GPS III Plus	01
18	Auger kit for sampling heterogeneous soils	01
19	Laboratory glassware washing	01
20	Percussion penetrometer	01
21	Fixed and variable charge permeameter	01
22	Polar digital planimeter	03
23	Diaphragm pump	02
24	Electronic total station with memory	01
25	Pocket stereoscope.	08
26	Folding mirror stereoscope	01
27	HP designjet 800 plotter and scanner	01
28	Analytical sieve (gamma of 23 different mesh openings)	01
29	Dial blood pressure monitor	01
30	Electronic digital theodolite	01

Laboratory title: Plant biology and physiology laboratory
(Can be used for other modules)

Student capacity: 30

No	DESIGNATION	Qty
1	Heating magnetic stirrer	08
2	BOD5 analyzer	01
3	Device for studying pressure losses	01
4	Bench-top autoclave	02
5	Analytical balance, capacity 210g	03
6	Precision balance, range 7200g	03
7	Hydraulic bench	01
8	Bunsen burner	30
9	Plastic bottles capacity 10 liters	30
10	Mortar grinder	01
11	Color CCD camera	01
12	Yahita Benchtop Centrifuge	02
13	Sigma Benchtop Centrifuge	01
14	Colony counter	02
15	Laboratory conductivity meter	03
16	Water demineralization	01
17	Ultrasonic disintegrator	01
18	Vacuum Desiccator	05
19	Water distiller	04
20	Flow over a dam	01
21	Drainer	03
22	Thermostatic enclosure, internal temperature 20°C	01
23	Bernoulli's Theorem Proof Set	01
24	Horizontal chamber kiln for ceramic firing	01
25	Filter hood	02
26	Refrigerated incubator	01
27	Metro scope magnifying glass	05
28	Elastic membrane manoscope	01
29	Binocular microscope with camera and camera adapters	01
30	Monocular microscope	10
31	Mineralizer with heating block 06 stations	01
32	Osborne Reynolds flow regime demonstration module	01
33	Automatic level with straight optics	02
34	Benchtop pH/mV meter	06
35	Flame photometer	01
36	Crucible tongs	30
37	Atomic absorption photometer	01
38	Plastic tray	10
39	Hydrostatic pressure	01
40	Backpack sprayer	01
41	Mineralization ramp	01
42	Laboratory refrigerator	01
43	UV-VIS spectrophotometer	03
44	Automatic universal titrator	01
45	Dissection kits	10
46	Laboratory turbidimeter	01
47	Nitrogen distillation unit 06 stations	01

B- Internship sites and in-company training:

Training place	Number of students	Training period
ANRH Constantine/Algiers	10	07 days
BNEDER Constantine/ Algiers	10	07 days
ONID BISKRA	10	07 days
ITDAS BISKRA	10	07 days
INRABISKRA / ALGIERS	10	07 days
INPVBISKRA / ALGIERS	10	07 days

C- Documentation available at the establishment level specific to the training offered:

A complete library for the Department of Agronomy and establishment of a shared faculty library between the Department of Agronomy and Biology and Maths.

We can cite some basic references in the library of the Department of Agronomy which are:

Coded	Title of the book	N o.
T4/001	Math matrix.	04
T4/003	The chemical reaction.	05
T4/005	General algebra.	05
T4/008	Organic chemistry simple mechanisms and functions	08
T4/009	Mathematics reports and supplements	02
T4/011	Combinatorial probabilities –statistics-	05
T4/013	Electromagnetism maxwell equations	2
T4/014	General chemistry	08
T4/020	Analytical Chemistry _ Electrochemical Methods.	30
T4/022	Biochemistry PCEM simple molecular constituents of the cell	1
T4/025	Chemical thermodynamic chemistry.	02
T4/026	Chemistry PCEM the atom and the chemical bond	05
T4/027	Biophysics of material vibrations, sounds and ultrasound.	38
T4/028	Physicochemistry.	38
T4/030	General physics and laws of motion.	12
T4/031	Chemistry PCEM kinetic redox equilibria and catalysis	04
T4/032	General organic chemistry.	14
T4/034	Chemistry simple functions.	01
T4/046	Mathematics for computer scientists (courses and problems 840 exercises solved)	1
T4/054	Modern physics theory and problems.	02
T4/057	Genetics (courses and problems 500 exercises solved)	3
T4/058	Organic chemistry 1. structure of molecules	08
T4/069	General chemistry (thermodynamics and kinetics).	06
T4/073	Modern organic chemistry	05
T4/088	The costs of free housing (the Farmer faced with the new built environment	1
T4/092	Essential computer Mathematicians مسألة 840 للحاسب الأساسية الرياضيات	1
T4/130	Principles of Chemistry	5
T4/140	Geology objects and methods	2
T4/150	Applied geology or civil engineering, nuclear engineering and the environment	04
T4/213	General hydraulics	11
T4/214	In-depth hydraulics	3
T4/215	Hydraulic Machines	09
T4/230	Details of plastic materials (structures properties implementation and standardization.	1
T4/236	Educational guide for healthcare workers.	1
T4/264	Materials volume: 1st metal materials.	1
T4/397	Common Core Chemistry (Collection of Exercises & Problems with Solutions)	06
T4/465	Diagnosis of soft wheat accidents.	04
T4/504	Modern genetic analysis	2
T4/505	Biochemistry	2
T4/506	Cellular and molecular biology	3

T4/507	Animal biology and physiology (Molecular, cellular, anatomical and functional bases – comparative and evolutionary orientations).	3
T4/508	Plant ecophysiology	04
T4/509	Developmental biology	3
T4/512	Tomato diseases (Observe identify fight)	05
T4/514	Animal health (cattle, sheep, goats)	03
T4/539	Constitution of the atom chemical bonds	5
T4/553	Systematic botany (a phylogenetic perspective).	2
T4/554	Mediterranean Options Irrigation and Agricultural Development	02
T4/562	Life and Earth Sciences with Geology	1
T4/572	Use of organic waste in vegetation guide to good practices.	01
T4/573	Spreading of sewage sludge on meadows and forage crops (Microbiological aspects).	01
T4/574	Animal societies (evolution of cooperation and social organization	2
T4/575	Molecular genetic animal production	1
T4/576	Developmental biology the main principles	5
T4/579	Help with risk management in the Agri-food industry using efficient analysis techniques	1
T4/580	Tobacco diseases observe, identify, fight	02
T4/581	Fertilize.	01
T4/583	Trypanosome risk (a global approach for a local decision.	2
T4/584	Atlas of canine and feline cytology	1
T4/587	Food microbiology	02
T4/590	News (scientific and technical in the agri-food industries).	02
T4/593	Cucurbitaceae diseases (observe, identify, fight)	2
T4/597	Microbiology and quality in the food industries.	02
T4/598	The management of collective irrigated areas at the dawn of the 21st century (Issues, problems, approaches	03
T4/599	Biochemistry of Foods Dietetics of Healthy Subjects	07
T4/600	Functional histology	1
T4/601	Spectroscopic techniques in Analytical Biochemistry	1
T4/623	Courses and corrected exercises in general chemistry	3
T4/627	Embryology	11
T4/629	Cytology	18
T4/630	General histology.	04
T4/632	General silviculture course notes	12
T4/633	Compilation of fungal plant diseases in Algeria	5
T4/634	Diseases of stone fruit trees	5
T4/635	Food constituents and their relationship to health	3
T4/644	Cereal and protein fungicides.	01
T4/645	Trees outside forests (towards better consideration).	03
T4/646	Salad diseases identify, know and control.	01
T4/649	Introduction to microbiology.	01
T4/656	Manuals of criteria and indicators for sustainable forest management ^{1, 2,6,5,6,7,8,9}	07
T4/659	Practical guide to micro irrigation	18
T4/661	Main elements of the nomenclature of chemical compounds.	02
T4/674	Ecology scientific and practical approach	2
T4/686	Microbiology	2
T4/687	Microbiology – lessons and review questions	1
T4/693	Ecology, planning and agricultural development of Algerian oases	30
T4/694	Contribution to the study of the characterization and germination of <i>balanites aegyptica</i> (L.) Del. In the Tamanrasset region (ahaggar-southern Algeria).	30
T4/695	Supporting groups towards sustainable agriculture.	04
T4/696	Phytosanitary protection pesticides.	02
T4/697	Production of eggs for consumption in warm climates.	1
T4/700	The basics of plant production volume II climate meteorology pedology conserves soils.	04
T4/701	The basics of plant production volume I soil and its improvement.	05
T4/702	The basics of plant production volume III the plant and its improvement.	04
T4/705	Elements of geology.	4
T4/715	Rocks and minerals of the world.	01
T4/717	Botany encyclopedia of botany ξ horticulture more than 10000 plants from all over the world.	02
T4/727	Introduction to botany.	01

T4/731	Microbiology an introduction.	01
T4/734	Plant biology.	01
T4/742	Evolution and ecology of the organism.	01
T4/744	The agricultural redhead.	02
T4/753	Mediterranean herbarium.	02
T8/000 3	Course & problem matrices.	04
T8/000 5	Variable complex courses and problems.	04
T8/000 6	Introduction to mathematical analysis.	05
T8/000 8	Introduction or calculation of probabilities.	05
T8/000 9	Elements of analysis based on a real variable.	04
T8/001 8	Introduction to chemical thermodynamics	09
T8/002 2	Electrical measurements (volume 1).	05
T8/002 7	Macromolecular synthesis polymers.	09
T8/003 8	Statistics course calculation of probabilities.volume 1	03
T8/003 9	Physical chemistry course.	06
T8/004 7	Mineral chemistry (COA module) VI- chemical bonds. VII- crystal structures. VIII- appendix.	04
T8/004 9	Physical chemistry 02 lessons and problems (02) -physical chemistry 1. lessons and problems (04)	06
T8/010 7	General algebra.	04
T8/115	General chemistry exercises and problems Volume 1: the chemical reaction	2
T8/116	General chemistry exercises and problems Volume 2: atoms	05
T8/117	General chemistry exercises and problems Volume 3: molecules	2
T8/121	Organic Chemistry Volume 1	2
T8/122	Organic Chemistry Volume 2	2
T8/130	General chemistry	05
T8/163	Higher and special mathematics (solved problems in electrostatics and dynamics of charged particles)	2
T8/176	Water and soil (physical principles and processes)	2
T8/182	General Hydraulics Manual	02
T8/188	Urban hydraulics Volume 2: transport, elevation and water distribution works.	02
T8/192	Basic topography course	04
T8/193	Geotechnics of the soil reconnaissance engineer.	02
T8/194	Topographic drawing course	2
T8/197	Elements of organic chemistry.	02
T8/200	Quantum.	02
T8/201	Introduction to relativity.	02
T8/202	General physics 1. mechanics and thermodynamics.	08
T8/212	Underground hydraulics	1
T8/213	Hydraulic Elements	2
T8/214	Urban hydraulics.	02
T8/214	Thorough hydraulics.	12
T8/215	Hydraulics and aggregates.	02
T8/218	Introduction to computers	21
T8/219	Introduction to computers	2
T8/220	Electricity exercises Volume 2	2
T8/221	Electrostatic and magnetostatic electromagnetism	1
T8/279	Organic chemistry	3
T8/332	Chemistry at PCEM (exercises with solution).	1
T8/351	Research and technology in the service of the environment.	03

T8/405	Precise physics course solved exercises (mechanics)	1
T8/410	Precise physics course solved exercises (thermodynamics)	1
T8/412	Summary of Mathematics lessons solved exercises (Algebre2)	1
T8/417	Precise physics lessons solved exercises (electricity2)	1
T8/434	Drinking water treatment plants waste water precise theoretical & technological	1
T8/435	Numerical analysis	5
T8/439	Summary of geology petrology	1
T8/442	Gas chromatography in inorganic chemistry	2
T8/445	First cycle Mathematics course (exercises, indications of solutions)	1
T8/448	Higher Mathematics Course Volume 1	2
T8/452	Update on the purification and treatment of effluents (water, Air)volumel	4
T8/453	Water pumping stations	2
T8/458	Potting soil resistance course	1
T8/461	Water testing in soil reconnaissance	1
T8/462	Geotechnical guide glossary and tests	1
T8/463	Territory Development	2
T8/463	Problem of soil mechanics and foundation techniques with solutions or answers	2
T8/046 8	Mathematics exercises Algebra, differential geometer Analysis.	02
T8/046 9	Elements of algebra and linear programming	02
T8/484	Biophysics.	15
T8/485	General Chemistry Volume 1	3
T8/490	Introduction to Algebra	08
T8/491	Elementary physics course Volume 1	3
T8/494	Fundamentals of chemical technology	3
T8/050 8	Mathematical statistics	03
T8/512	Chemical technology 1.2.	4
T8/051 6	Introduction to computers	02
T8/518	Soils of arid regions of Algeria	5
T8/519	Topology course	2
T8/522	Geological and geotechnical monograph of the Algiers region (collection of notes).	05
T8/523	Drip irrigation (irrigation scheme)	14
T8/051 6	Introduction to computers	02
T8/052 2	Introduction to computers	01
T8/053 8	Introduction to computers	01
T8/541	Physical chemistry course	02
T8/566	English – French dictionary of electronics and electrical engineering.	1
T8/060 8	Mathematics & computer science	06
T8/061 2	History of chemistry	09
T8/061 5	Chemistry corrected	02
T8/061 9	Introduction to data analysis.	02
T8/062 0	Principles of computer operating systems	01
T8/062 1	Commented exercises in statistics and applied computer science.	01
T8/062 2	Reason to program	02
T8/063 5	Introduction to analysis.	02
T8/064	Elementary course of higher mathematics 2- usual functions.	01

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T8/064 5	Elementary course of higher mathematics 1-algebra.	04
T8/064 5	Geometry	03
T8/064 5	Elementary course in higher mathematics 1-Algebra 4- differentials 2- usual functions	05
T8/064 5	Elementary course in higher mathematics 1.Algebra 2.usual functions 3.integral calculation and series.	03
T8/646	Organic chemistry exercises	02
T8/064 7	Continuous linear servos	03
T8/064 8	Physics problems.	04
T8/662	Forced flows in hydraulics part 2	2
T8/663	Chemical thermodynamics from the tutorial course	08
T8/066 4	Hydrogeology and phytogenic transport.	13
T8/066 7	Linear algebra course.	07
T8/066 8	Introduction to probability calculus	02
T8/067 1	Athos and chemical links of the use of common cores.	04
T8/672	Thermodynamics acid-base equilibria redox salts in kinetic solution	13
T8/067 4	Probability course.	05
T8/068 8	Introduction to probability calculus	04
T8/071 7	Chemistry vocabulary glossary.	01
T8/071 8	Linear algebra lessons and solved exercises.	07
T8/072 0	French-Arabic physics vocabulary glossary.	05
T8/072 1	Surface physico-chemistry.	10
T8/072 5	Algebra	06
T8/075 6	Treatment of drinking water.	16
T8/077 7	Guide to mapping topographic and geological sections.	03
T8/779	Chemistry the minimum subsistence	09
T8/078 5	Mathematics life sciences.	08
T8/078 7	Introduction to general and underground topography	05
T8/078 8	Algebra courses and corrected exercises	05
T8/790	Chemistry exam topics with solutions	4
T8/079 8	Hydraulic machine and compressor	05
T8/084 0	Chemistry exercise.	01
T8/841	100 organic chemistry exercises	1
T8/084 2	Organic chemistry exercise (exercise with solution).	01
T8/843	Corrected thermodynamics exam problems	1
T8/084 5	Corrected math problems.	02

T8/084 7	Corrected math problems.	02
T8/084 9	Corrected math problems.	02
T8/085 0	corrected math problems	02
T8/085 1	Corrected math problems.	02
T8/085 3	Mathematics at the Ecole Polytechnique oral exam.	01
T8/085 4	Some beautiful math problems we have mole programs summarized in 14 problems.	11
T8/085 5	Corrected mathematics problems posed for competitive exams (ENAC).	01
T8/086 0	Corrected math problems.	01
T8/086 1	Geometry (Differential equations)	01
T8/086 2	Corrected mathematics exercises Volume II: Algebra and geometry	04
T8/086 4	Mathematics After the BAC.	01
T8/086 5	Corrected math problems.	01
T8/898	Analysis and regulation of industrial processes volume I continuous regulation	5
T8/909	Mathematics for use by engineering office technician students	2
T8/092 6	Corrected mathematics problems (C program).	02
T8/092 7	Corrected exercises in competitive floral mathematics.	01
T8/093 5	Biological water purification.	02
T8/108 7	Elements of soil mechanics	4
T8/112 5	Chemical kinetics	2
T8/113 0	Seismology Elements	07
T8/113 1	Physical bases of seismic methods	3
T8/113 4	Soil Science Dictionary	1
T8/118 9	Logs applied to hydrology	2
T8/126 1	Statistical models for AI the example of medical diagnosis.	1
T8/132 3	Soil: interface in the environment, resource for development	1
T8/133 9	Algebra and geometry.	02
T8/135 4	General hydraulics.	01
T8/137 1	Physical fluid mechanicsand Applied thermodynamics (flows of gases, steam, air, etc.).	01
T8/137 4	Groundwater thermal	02
T8/138 1	Elements of agriculture and livestock	02
T8/138 2	Analytical study of chemical reactions in water.	01
T8/138	Agriculture and fertilization.	01

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T8/1370	Cultivated soils	1
T8/1374	Groundwater thermal	1
T8/1380	Geographic information systems in image mode	1
T8/1381	Trace elements in agriculture and livestock	1
T8/1385	Botanical.	1
T8/1396	Soil physics	1
T8/1400	Plant metabolism physiology and biochemistry	3
T8/1408	General directory of foods (table composition tables).	01
T8/1425	Elements of Thermodynamics (courses and corrected exercises for the second cycle of chemistry)	2
T8/1426	Thermodynamics and chemical equilibria (lessons and solved exercises)	1
T8/1428	Inorganic and general chemistry, practical work with comments, 34 themes and 70 experiments.	2
T8/1434	The glasses and the vitreous state.	2
T8/1491	Unit processes for drinking water treatment	1
T8/1494	Encyclopedia of Urban Hydrology and Sanitation	1
T8/1500	The book of steel.	01
T8/1509	Toponymy and space in Algeria	03
T8/1510	Legislation on the environment and the conservation of nature and natural resources	2
T8/1550	Applied urban hydraulics part 2 hydraulic sizing of rainwater collectors	2
T8/1566	Thermodynamics (course reminders reflection questions practice exercises.	1
T8/1597	Food additives and processing aids	2
T8/1619	The great classics of chemistry and thermodynamics	2
T8/1620	Summary of atomistic PC-SI-PC chemistry and structures	03
T8/1621	Chemistry experiments for the physical sciences capes organic chemistry and general chemistry	1
T8/1622	Chemistry summary (MPSI-PTSI)	1
T8/1622	Regeneration (somatic embryogenesis from the organism to the molecule	1
T8/1623	Chemical thermodynamics	1
T8/1625	Chemical kinetics and structural chemistry	1
T8/1626	Inorganic chemistry	03
T8/1628	Understand and deepen chemistry 2- Atomistics and structure of matter	1
T8/1630	Understand and deepen chemistry 3- Thermodynamics and chemical kinetics	02

T8/163 5	Thermodynamics and Chemical Kinetics course summaries and corrected exercises	1
T8/164 9	Elementary theory of analytical functions of one or more complex variables	1
T8/165 3	Differentiable varieties. Forms, currents, harmonic forms.	1
T8/165 5	Geometric & wave optics 98 problems solved	1
T8/165 7	Optical and wave physics exercises	1
T8/165 8	Mechanical physics Thermodynamics electricity vibrational movements optics radioactivity	1
T8/184 9	Parasitism a dynamic equilibrium.	1
T8/190 4	Metamorphic rocks and their precise geodynamic petrology significance	3
T8/190 7	Algebra & geometry 120 developed exercises, 350 training exercises course reminders	1
T8/191 1	Linear algebra an introduction course and corrected exercises	1
T8/191 2	Algebra (course reminders, exercises and solved problems)	1
T8/191 4	Analysis (course reminders, exercises and solved problems)	1
T8/191 5	Tutorials in mathematics	5
T8/192 4	Analysis (556 corrected exercises)	1
T8/192 5	Best of mathematics the best competitive exam subjects	1
T8/193 7	Operations Research Exercises and Solved Problems	1
T8/193 8	Functions of a variable	1
T8/194 0	The mathematical tool for physics	1
T8/194 2	Common mathematics for scientists and engineers	1
T8/194 4	Mathematics for aggregation	1
T8/194 5	Mathematics for the DEUG algebra and geometry	1
T8/194 7	1st year mathematics	1
T8/194 8	Mathematics (34 corrected written problems from CAPES)	1
T8/194 9	Mathematics algebra, analysis, geometry (42 problems solved)	2
T8/195 0	Mathematics (complete course, 527 corrected exercises)	1
T8/196 4	Analytical Chemistry	1
T8/196 5	Analytical chemistry Volume 2: separation methods	3
T8/197 0	Organic chemistry (course reminders, reflection questions, practice exercises)	1
T8/197 8	Balances in aqueous solution (143 corrected exercises with lesson reminders)	1
T8/198 0	Chemical risk analysis guide	1
T8/198	The synthesis strategy through exercises	1

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T8/1987	Inorganic physico-chemistry (an approach based on coordination chemistry)	1
Q8/2007	Ancient dams of Syria.	01
T8/2050	Maxwell equations electromagnetic waves	1
T8/2051	Corrected quantum mechanics exercises	1
T8/2052	Electrostatics and magnetostatics exercises (97 exercises and corrected problems with course reminders).	1
T8/2057	Introduction to thermodynamics	1
T8/2060	Mechanical and sound waves (70 problems solved)	1
T8/2061	Ionizing radiation (dosimetry detection, spectrometry)	1
T8/2062	Spiders in physics	1
T8/2063	Mass spectrometry (mains and applications).	2
T8/2065	Mechanics 2 (course and 73 corrected exercises).	1
T8/2067	Physics memo (synthesis of formulas and essential laws of physics)	1
T8/2068	Elastic waves in solids Volume 1: free and guided propagation	2
T8/2069	Electromagnetic waves in vacuum and conductors 70 problems solved.	1
T8/2070	Optics (course and 94 solved exercises)	1
T8/2071	Physics of phase transitions (concepts and applications)	1
T8/2203	The essentials in genetics	3
T8/2204	Dictionary of Plant Biogeography	02
T8/2205	Improvement of cultivated plant species (objectives and selection criteria)	03
T8/2208	Systematic botany of flowering plants.	1
T8/2211	Biochemistry and molecular biology memory aid	1
T8/2225	Invertebrate Zoology	1
T8/2226	Producing organic milk (successfully making the transition	03
T8/2227	The plant world from the genome to the whole plant.	1
T8/2228	Trace elements in medicine and biology	2
T8/2229	Green fertilizers and soil fertility	2
T8/2230	A 3rd way in large-scale cultivation (environment, quality, profitability)	2
T8/2231	Agides to sugarcane say ases	03
T8/2232	Growing the date palm.	01
T8/2233	Feeding cattle, sheep & goats	2

T8/223 4	Guide to soil analysis	1
T8/223 5	Wheat grain composition and use	05
T8/223 6	Agronomy from the basics to new directions	04
T8/223 7	Hail risk in agriculture	03
T8/223 8	Industrial dairy products	2
T8/223 9	Experimental methods in agronomy (practice and analysis)	2
T8/224 0	Chemistry of solutions	2
T8/224 1	General chemistry	2
T8/224 2	Industrial organic chemistry	1
T8/224 3	The periodic classification of the elements	1
T8/224 5	Experimental physical chemistry	1
T8/225 1	Macromolecular chemistry exercises and problems	1
T8/225 2	Organic chemistry exercises and problems	1
T8/225 3	Introduction to polymer materials.	01
T8/225 4	Stereochemistry of organic compounds	1
T8/225 5	Chemical engineering for chemists	1
T8/228 7	Protection perimeters for groundwater catchments intended for human consumption	3
T8/229 0	Measurements in urban hydrology and sanitation	1
T8/229 1	Treaty of irrigation	05
T8/232 7	Collective intelligence.	1
T8/233 8	Active packaging.	01
T8/234 6	Biopolymer science: food and non-food application	1
T8/235 0	General chemistry exercises. for use by common core students	08
T8/235 4	Applied soil mechanics problems solved.	05
T8/235 9	Poultry nutrition and feeding.	03
T8/236 0	CAP and the regions building a multidisciplinary form of work for the analyzes of the EU agricultural space	2
T8/236 1	Nitrogen control in agro systems.	1
T8/236 2	Agrometeorology of multiple cropping in warm climates.	03
T8/236 3	Contaminant soils.	2
T8/236 4	Biopolymer science: food and non-food applications	1
T8/241	Chemistry class	1

6		
T8/2480	Matlab 5.2&5.3 and simulink 2&3.	1
T8/2519	Microbiology and infectious pathology.	2
T8/2524	Vegetative organization	2
T8/2525	The reproduction.	02
T8/2560	Environmental chemistry Air, water, soil, waste.	3
T8/2565	Atlas Plant Biology 1. organization of plants without flowers .2. organization of flowering plants.	3
T8/2673	The drying up of dairy cows.	1
T8/2711	Protocols in computer networks	01
T8/2715	Organic chemistry (the main principles).	1
T8/2783	General mechanic.	1
T8/2791	Thermodynamics and statistical mechanics.	1
T8/2794	Fuels and engines.	1
T8/2799	Learn mechanics lessons and correct exercises.	1
T8/2812	Rainwater recycling (planning, construction, and electronic control of a recovery installation.	1
T8/2820	Maintenance diagnosis availability of rotating machines (models _ measurements _ vibration analyzes)	1
T8/2823	Individual pumping stations for irrigation.	01
T8/2824	Fact in the emergence of arbovirus diseases	03
T8/2825	The power of life (dynamics of biological systems).	2
T8/2826	Principles of molecular biology techniques.	2
T8/2827	Principles of plant virology (gi nome, power, pathogen, ecology of viruses).	1
T8/2828	A point on water Volume 1: natural environment and control.	2
T8/2829	Color atlas plant structure.	2
T8/2830	Perfume plants and fatty essential oils.	03
T8/2831	Enzymatic biotechnology (instructions for use) medical food industry environment.	1
T8/2832	Plant Physiology 2.Development.	4
T8/2833	Biochemistry 1st cycle lessons and review questions.	2
T8/2834	Biochemistry and biophysics of membranes. structural and functional aspects.	2
T8/2835	Biological dynamic biodiversity and conservation.	3
T8/2836	Animal biology atlas. 1 major organizational plans.	3
T8/2837	Biology of animal and plant populations.	4

T8/283 8	Dictionary of Botany.	1
T8/283 9	Ecology from the ecosystem to the biosphere.	1
T8/284 0	Genetics (course reminders, exercises and corrected problems).	3
T8/284 1	Analysis of genomes, transcriptomes and proteomes.	2
T8/284 2	Animal reproduction strategies (the evolutionary adventure of the sesquialtera)	5
T8/284 3	Plants organization and biological diversity.	1
T8/284 4	Genetic engineering and biotechnologies: concepts and method applications to agronomy and bio-industries.	1
T8/284 5	Quality control of cereals and protein crops (practical guide).	1
T8/284 7	Melon for a quality product.	03
T8/284 8	Cherry varieties and their management (practical guide).	2
T8/284 9	Fruit & vegetable guide.	02
T8/285 1	Fruit production references.	2
T8/285 2	Olive Tree.	02
T8/285 3	The almond tree.	1
T8/285 5	Phytosanitary protection of vegetables and small fruits.	02
T8/285 6	Industrial organic chemistry.	1
T8/285 7	Organometallic chemistry.	4
T8/286 1	Chemical thermodynamics.	2
T8/286 3	Physical and analytical electrochemistry.	1
T8/286 5	General chemistry course and 70 corrected exercises.	3
T8/286 8	Theoretical chemistry applications to spectroscopy.	1
T8/287 1	Wood insects and fungi.	03
T8/287 2	Mastery of tomato fertilizing irrigation in greenhouses and shelters.	03
T8/287 3	Agroeconomics of oases.	2
T8/287 4	Characterization and valorization of sorghum.	3
T8/287 5	Conversion to organic farming in the case of dairy production.	2
T8/287 6	An update on food and food industries: public research priorities.	03
T8/287 7	Virus diseases of ornamental plants.	04
T8/287 8	Guide to soil description.	2
T8/287 9	An update on: physical control in phytoprotection.	03
T8/288	Ground: fragile interface.	2

0		
T8/288 1	Intensive agriculture and water quality.	2
T8/288 2	Water in rural areas (life and aquatic environments).	2
T8/288 3	Manual of food bacteriology.	2
T8/288 4	Herbivorous animal production	01
T8/288 5	Static methods.	2
T8/288 6	Dairy cow breeding in tropical areas.	03
T8/288 7	Sheep breeding.	02
T8/288 8	Raising rabbits Volume 2.	1
T8/288 9	Chickens visible genetic diversity.	03
T8/289 0	History of surveillance and control of transmissible animal diseases.	2
T8/289 1	The horse and its diseases.	1
T8/289 2	Poultry disease.	2
T8/289 3	Atlas of cell biology.	2
T8/290 5	Monitoring, maintenance and diagnosis of flood protection dikes practical guide for use.....	02
T8/290 9	Plant structure and development morphogenesis and reproductive biology of angiosperms.	03
T8/291 0	Introduction to geology and topography (for use by helpers – geologists, construction site and operating technicians, etc.).	1
T8/291 1	Geology.	1
T8/291 2	Karst details	02
T8/291 3	Man facing floods and floods.	03
T8/291 4	The Quaternary (geology and natural environments).	02
T8/291 5	Sedimentology.	2
T8/291 7	Nitrogen-fixing trees.	01
T8/291 8	Development and applications of genomics (after _ genome).	1
T8/292 2	Protein engineering and its applications.	1
T8/292 3	Details of food risks.	1
T8/292 4	Biotechnology.	1
T8/292 7	Ecology of running waters.	1
T8/293 1	Analysis and control techniques in the food industry.	2
T8/293 4	Virus diseases of fruit trees.	1
T8/293 5	Elements of toxicology.	1

T8/2936	food science from A to Z	2
T8/2937	Assessment of the ecological risk of polluted soils.	1
T8/2938	Comment on the topographical map for exams and competitions.	1
T8/2940	The forms of terrestrial relief (Notions of geomorphology).	2
T8/2941	The great rivers.	1
T8/2942	Volatilization of ammoniacal nitrogen from slurry after spreading (quantification and study of influencing factors).	05
T8/2945	Methods statistician in biology.	1
T8/2964	Micro irrigation maintenance.	01
T8/2968	Update on earth sciences (1.2.3.4)	08
T8/2969	Plate tectonics (the internal activity of the terrestrial globe and its consequences).	02
T8/2987	Industrial safety from accident prevention to emergency organization.	1
T8/3003	IT and business strategy	1
T8/3029	Quantum chemistry exercises and problems solved.	1
T8/3030	Cartography (practical for geography and planning).	1
T8/3058	Christ geometric allograph and x-ray crystallography	1
T8/3060	Horse nutrition.	2
T8/3061	Sheep production.	02
T8/3062	Cattle disease.	1
T8/3063	Sheep diseases.	1
T8/3064	Animal metamorphoses (ecological transition).	1
T8/3065	The production of suckling cattle.	02
T8/3066	French sheep and goat breeds.	03
T8/3067	40 years of agricultural history Volume 1: (lost opportunities 1955-1981)	2
T8/3068	Agricultural professions (farmer, advisor, researcher, etc.)	03
T8/3069	Campylo trope and food hygiene.	1
T8/3070	Functions and values of wetlands.	03
T8/3071	Abstract of food biochemistry.	2
T8/3072	Plants and the cold.	03
T8/3077	Operational research techniques (simplex algorithm).	1
T8/3078	The essentials in ecology.	2
T8/307	The essentials of chemistry for biologists.	2

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T8/3080	The essentials of biochemistry.	3
T8/3081	The essentials of animal biology.	3
T8/3085	Organic chemistry _ the main principles_	1
T8/3101	Botany (molecular systematics).	1
T8/3102	Embryology early development in humans.	2
T8/3107	The biology of the mind (origins and structures of the mind, the brain and consciousness).	1
T8/3110	Geology.	1
T8/3120	Transfer of pollutants in hydro systems.	2
T8/3134	General chemistry.	1
T8/3148	Merise and for modeling information systems	3
T8/3156	Cesium from the environment to humans.	2
T8/3161	Statistical physics and thermodynamics.	1
T8/3176	Understand the rheology of blood circulation when concrete sets.	1
T8/3187	Inorganic chemistry theories and applications.	1
T8/3189	Radioactive pollutants (impact on the environment).	1
T8/3191	NMR concepts, methods and applications	1
T8/3192	Grass productivity.	03
T8/3193	Ionizing treatments and food pressure covers.	1
T8/3195	Integrated stone fruit protection.	2
T8/3196	Weeding of fruit trees.	01
T8/3197	Date Palm Skills.	2
T8/3198	New chemistry form.	1
T8/3199	Industrial chemistry.	1
T8/3200	Chemistry and physico-chemistry of polymers.	1
T8/3201	Sufficient management of vegetable crop workforce.	01
T8/3202	Foods under labels (origin, safety, quality).	1
T8/3246	Human anatomy and physiology.	1
T8/3247	At the heart of life (or kingdom of the living cell).	3
T8/3248	Bacteriology.	2
T8/3249	Cellular biology.	2

T8/325 0	Plant's biology.	1
T8/325 1	Chemistry of aquatic environments (Chemistry of natural waters and interfaces in the environment).	2
T8/325 5	Dictionary of the environment.	2
T8/325 8	Introduction to botany.	01
T8/326 0	Introduction to Genetic Analysis	1
T8/326 1	The Biochemistry of lubricating streak.	1
T8/326 2	The essentials in Energy Physiology	1
T8/326 3	Genetic diagnostics.	1
T8/326 5	Principles of zoology (structure-function and evolution).	02
T8/331 2	Conventional protection of natural species.	01
T8/336 0	Soil engineering (testing, saying, and handing over)	1
T8/338 6	Molecular biology	1
T8/338 7	Discovering IT.	03
T8/341 1	Solved problem of thermodynamics and statics of fluids.	2
T8/341 2	Solved problem of electromagnetism general laws and induction phenomena.	1
T8/344 5	Organic chemistry	5
T8/345 0	Thermodynamics course summary with exercises and solved problems.	1
T8/345 2	Elements of seismology.	2
T8/345 6	Some applications in hydraulics.	5
T8/346 4	Medicinal plants from Algeria.	16
T8/346 5	Botany (course for agronomists) systematics of spermaphytes.	21
T8/346 6	Etymology of plant names from the Mediterranean basin.	26
T8/346 9	Mathematics (function of a real variable).	4
T8/347 4	Biological samples pre-analytical phases and samples in medical biology	3
T8/347 7	Environment and agriculture.	01
T8/355 1	Ductile design of salt structures.	01
T8/355 2	Hand book of civil. Engineering calculations.	01
T8/367 2	Mediterranean agriculture (variety of ancient techniques).	02
T8/367 3	Detection and isolation of soil fungi.	01
T8/367 9	The Apple tree	02
T8/368	Agricultural machinery.	01

2		
T8/368 3	Farm products processing and marketing.	01
T8/368 5	Alfalfa.	01
T8/370 5	Watercourse and biological index.	01
T8/371 9	The first age of AND.	01
T8/372 6	Heterocyclic organic chemistry.	1
T8/378 2	courses, exercises and solved problems in Chemical Thermodynamics.	5
T8/379 4	Electrical measurement methods and techniques.	2
T8/379 9	Production of food juices (food industry technology).	12
T8/380 0	Performance of fruit tree grafting.	28
T8/380 1	Wheat processing technology and problems caused by stock insects.	27
T8/380 2	Numerical analysis course.	27
T8/380 3	Probabilities.	2
T8/380 6	Medicine of control and expertise	17
T8/381 2	Electricity numerical analysis course.	3
T8/381 3	Spectroscopy.	4
T8/381 4	General atomistic chemistry.	4
T8/381 6	100 Corrected Chemistry Exercises.	4
T8/381 8	Electricity.	5
T8/381 9	Landslides (stability calculation).	5
T8/388 9	Asse Rance and environmental risks	1
T8/390 8	Management of environmental problems in the agri-food industries.	01
T8/391 6	Water in rural areas, aquatic life and environments.	01
T8/391 8	ecology to the aid of life (medicine for tomorrow).	01
T8/393 1	Optics (reference courses)	1
T8/393 4	Principals of terrestrial ecology.	01
T8/397 2	Vitamins in the food industry	02
T8/397 3	Quality control	2
T8/397 4	Sensitivity of weeds to herbicides in field crops.	03
T8/398 6	Geological environments human activities	3
T8/404 6	Ornithology applied to Agronomy and Forestry.	29

T8/404 7	Locusts and grasshoppers (Acridology).	28
T8/404 9	Food biochemistry.	06
T8/405 2	General chemistry exercises.	10
T8/405 3	Clinical examination of the horse – Practical manual of propaedeutics & hippology in Algeria.	10
T8/405 6	Corrected chemistry exercises.	04
T8/405 8	Elements of probability theory volume 2.	06
T8/405 9	SE M 300 exams (1st year analysis and algebra.	04
T8/406 5	History of the earth.	02
T8/408 4	Radioactivity serving industry and the environment	02
T8/408 9	Localized pollution of soils and subsoils by hydrocarbons and chlorinated solvents.	1
T8/410 4	Water, environment and public health.	01
T8/410 9	French Arabic glossary of microbiology (bacteriology, mycology, phycology, protozoology and virology)	07
T8/411 9	Chemistry of natural products and living beings.	05
T8/413 1	Dictionary of geography.	01
T8/414 2	Introduction to mathematical analysis.	05
T8/415 6	Biology & genetics.	25
T8/415 7	Molecular biology.	23
T8/415 8	Structural biochemistry (proteins, carbohydrates, lipids, nucleic acids).	05
T8/415 9	General hydraulics.	05
T8/416 2	Guide to reasoned fertilization (field crops and meadows).	02
T8/416 4	Varieties of peaches and nectarines	02
T8/416 5	Perspectives for mountain geobiology.	04
T8/416 6	Mountain geobiology.	01
T8/416 7	Tectonic.	2
T8/418 0	Cellular biology (corrected and commented exercises).	4
T8/419 9	Organic chemistry exercises.	01
T8/420 1	In search of sustainable agriculture (study of economical grassland systems in Brittany)	1
T8/420 2	Agro tribulations	03
T8/420 4	Fertilization of orchards environment and quality.	01
T8/420 5	The meaning of practices (farmers' conceptions and agronomists' models)	1
T8/420	Phytosanitary products (distribution and application, different control methods and choice.....volume 1.	01

6		
T8/4207	Organic market gardening.	1
T8/4208	Spatial organization of agricultural activities and environmental processes.	03
T8/4249	Sustainable development of urban agriculture in French-speaking Africa (issues, concepts and methods).	08
T8/4251	The French agro-environmental experience.	02
T8/4263	Green chemistry.	01
T8/4268	Botany (plant biology and physiology).	1
T8/4274	Dictionary of Biology.	01
T8/4281	Molecular biology.	2
T8/4283	The subject of synthesis by example.	03
T8/4291	Biological anthropology.	1
T8/4300	Process fresh dairy products on the farm.	1
T8/4308	Molecular evolution (lecture and review questions).	2
T8/4310	Cellular biology (commented questions and answers).	2
T8/4314	The cell society new approach to cancer.	2
T8/4342	Salinity and crop production.	02
T8/4350	Introduction to phyto-ecology	3
T8/4334	Developmental biology.	3
T8/4429	Environmental studies	01
T8/4481	Dictionary of geology and geomorphology.	01
T8/4485	Plant improvement (application to the main species cultivated in tropical regions).	1
T8/4513	Cellular and molecular biology.	3
T8/4529	Practical guide radionuclides & radiation protection.	3
T8/4536	Lactic acid bacteria and probiotics.	1
T8/4537	Groundwater chemistry and pollution.	3
T8/4543	Water in food.	1
T8/4549	Structures and technofunctions of milk proteins.	1
T8/4550	Thrust and land stop tables.	3
T8/4561	Parasitises of domestic animals.	18
T8/4563	Cytology & cellular physiology.	8
T8/4564	Illustration of the plant biology course.	28

T8/457 6	Entiobacteria systematics and diagnostic methods.	1
T8/457 8	Biology of organisms.	3
T8/459 2	Environmental microbiology and biotechnology.	2
T8/459 3	Environmental pollution (monitoring and control).	1
T8/459 6	Industrial pollution.	1
T8/459 9	irrigation theory and practice.	01
T8/460 1	Noise pollution and so-called control.	1
T8/460 4	Physical and chemical methods in soils analysis.	01
T8/460 5	Questions & answers in phisiology and biochemistry.	1
T8/460 9	Water pollution (causes, effects and control).	1
T8/461 2	Clean room technologies.	3
T8/461 6	Elements of cell biology.	2
T8/469 2	Aromatic plants and fatty essential oils. Botany, culture, chemistry production and market.	01
T8/469 4	Biodiversity objects, theories, practices.	01
T8/469 6	Agriculture and development in the world.	03
T8/469 8	Agricultural advisor.	03
T8/470 0	The environment of the primitive earth	01
T8/470 1	Atmospheric pollution by metals (biomonitoring of fallout).	01
T8/470 2	Science of life and the earth, aggression and defense of organisms (Tuscans, poisons, detoxification venoms, etc.)	01
T8/470 9	Encyclopedia of trees more than 1800 species and varieties from around the world.	01
T8/471 1	The plant genius of fragile conquerors.	01
T8/471 4	The essentials of cell biology.	01
T8/471 5	Medicinal plants from Africa (how to recognize and use them)	02
T8/471 6	Kinetic cold plasmas transport and transfers.	01
T8/471 8	The book of trees, shrubs & shrubs A	02
T8/471 8	The book of trees, shrubs & shrubs B	02
T8/478 5	Forest ecology (a foundation for forest management and environmental ethics in forestry).	01
T8/479 5	Natural resource and environmental economies.	01
T8/481 2	Soil science	
T8/481 3	the basics of agriculture.	01
T8/481	Development and maintenance of plant areas.	

5		
T8/481	Landscape ecology (concepts, methods and applications)	01
6		
T8/483	Eating behaviors.	01
3		
T8/485	Introduction to entomology (morphology, anatomy, systematics and biology of main orders insects).	01
7		
T8/489	Precision agriculture.	01
1		
T8/489	Eco toxicology theory and applications	01
3		
T8/489	Introduction to the ecotoxicologist, foundations and applications.	01
8		
T8/490	The rose in the greenhouse for the cut flower	01
3		
T8/490	Use of herbicides in forests and sustainable management.	01
8		
T8/490	Soil microbial life and plant production.	01
9		
T12/08	Physical chemistry concepts.	1
8		
T12/11	The fertility of tropical soils.	1
3		
L8/002	Agricultural research.	2
L8/003	Proceedings of the national workshop on the development strategy for forage crops in Algeria.	1
L8/004	Ground work.	5
L8/005	The fava bean.	5
L8/006	Chemical weeding of wheat.	2
L8/007	Traditional wheat cultivation in Algeria opportunities for improvement.	6
L8/008	The multiplication of certified seeds (programming method).	5
L8/009	Stages and varieties of wheat.	5
L8/010	Alexandrian clover (bersim)	5
L8/011	Alfalfa.	6
L8/012	Sampling of seeds for analysis.	5
L8/013	Cereal harvest (practical advice)	3
L8/014	Calendar of cultural operations.	1
L8/015	Practical guide to growing artichokes.	5
L8/016	Practical guide to potato plants.	6
L8/017	Information guide.	11
L8/018	Practical guide to the production of industrial tomato plants.	7
L8/019	National strategy for sustainable rural development.	2
L8/020	إعداد وتنفيذ مشروع جوارى للتنمية الريفية (دليل الإجراءات)	1
L8/021	Practical guide to chili peppers in greenhouses.	07
L8/022	Chilli/pepper cultivation.	8
L8/023	Tomato cultivation.	1
L8/024	Practical guide to growing tomatoes in greenhouses.	3
L8/025	Kiwi culture.	1
L8/026	Vine varietal guide.	1
L8/027	Potato moth	34
L8/028	Practical guide to potato cultivation.	1
L8/029	Boufaroua of the date palm.	39
L8/030	تقليم أشجار الورديات – ذات النواة -	1
L8/031	تقليم الترابية لأشجار الورديات – ذات النواة والبذور -	1
L8/032	زراعة التريتكال	5
L8/033	الملتقى يوم 30/11/2006 في جامعة بسكرة – يوما دراسيا حول التمور وأفاقها.	10
L8/034	مجلات المزارع العربي.	9
L8/035	Agriculture in the national economy.	1
L8/036	PROCEEDINGS of international journals on desertification and sustainable development.	1
L8/037	Algerian Journal of Arid Regions (CRSTRA).	5
L8/038	Communications from the international “land and water” conference (CRSTRA).	1

L8/039	The climate of Algeria.	1
L8/040	Proceedings Study and awareness days on the quantification of sand in wind transit and on the fight against...	1
L8/041	International days on the impact of climate change on arid and semi-arid regions.	03
L8/042	Second part of the act of the first National seminar on the theme "Agriculture, Environment and health"	03
L8/043	إكثار أشجار الزيتون	01
L8/044	Industrial tomato cultivation	01
L8/045	Potato pre-germination	01
L8/046	Practical guide to dry crops of somemedicinal, condimentary and aromatic plants. In area...	01
L8/047	The cultivation of Nigella (Nigella sativa L.) in subhumid zones.	01
L8/048	Growing Fenugreek (trigonella foenum graecum L.) in subhumid zones.	01
L8/049	Sahara hydrographic basin	08
L8/050	Triple super Phosphate (TSP) المركز ثلاثي الفوسفات المركز ،NPK 10.10.10 Sulphated (السماد الأزوتي السمدة) الأسمدة Nitrogen السولفازوتي Urea 46%N ل يوريا Simple Nitrogen Fertilizer: أسمدة ازوتية بسيطة 46%P2O5 sulfate 26%N+12%S).	01
L8/051	الملتقى الوطني حول الزراعة الصحراوية عوائق وآفاق	01
L8/052	Good practices of environmental management systems for small and medium-sized enterprises (a perspective..)	01
L8/053	Children's health and the environment in Northern Africa (first report on available indicators and measures)	01
L8/054	Creating a healthier environment for our children (overview of the environmental challenges posed by children's health...	01
L8/835	Macroeconomic theories (foundations and controversies).	01
L8/0859	Agri-food dictionary: French English English-French	01
L8/882	Theory and practice of constituent power.	1
L8/908	Integration: policies in crisis.	1
L8/2590	Business Economics.	1
L8/2689	Archaeozoology	01
L8/2913	Ecological risks in Algeria.	3

D- Personal work spaces and ICT available at the department and faculty level:

The diversity of disciplines offered within This training allows students to master modern information and communication techniques (ICT).

This training is based on an integrated method which brings together several modules: these are mainly modules directly related to soil science and crops as well as the environment.

A simple way of presenting these modules is to say that it deals with both the management of irrigation over time (piloting).

We see here all the interest in training, and the importance that must be given to modern techniques, in particular the modeling aspect, such a strategy requires good mastery of computer tools, which facilitates communication between teachers. and the student for rapid and timely dissemination of information.

A computing center equipped with 30 workstations connected to the Internet is planned jointly between biology and agronomy and math.

II – Half-yearly organization sheet for specialty teaching (S5 and S6)
(include the annexes to the decrees of the common bases of the field and the sector)

Semester 5:

Teaching units	Materials	Credits	Coefficient	Weekly hourly volume			VHS (14-16 weeks)	Other*	Evaluation method	
	Titled			Course	Tutorials	PW			Continuou s monitoring	Exam
Fundamental EUCode: UEF 3.1.1 Credits: 12Coefficients: 6	Subject 1: general pedology	8	4	3:00 a.m.	1h30	1h30	90H:00	90h00	40%	60%
	Subject 2: soil mapping	4	2	1h30	1h30		45h00	45h00	40%	60%
Fundamental EUCode: UEF 3.2.1 Credits: 10Coefficients: 5	Subject 1hydrogeology	6	3	1h30	1h30	1h30	67h30	67h30	40%	60%
	Subject 2 hydrology	4	2	1h30	1h30	-	45h00	45h00	40%	60%
EU methodologyCode: UEM 1.1Credits:2 Coefficients:2	Subject 1: special phytotechnics	2P	2	1h30			30h00	30h00		100%
UEmethodologyCode: UEM 2.1Credits:2 Coefficients:1	Subject 2: crop protection	2	1	1h30			22h30	22h30		100%
Discovery EU Code: UED1 .1Credits:2 Coefficients:1	Subject 1: forestry	2	1	1h30			15h00	15h00		100%
Transversal EUCode: UET 1.1Credits:2	Subject 1: zootechnics	2	1	1h30			15h00	15h00	40%	60%

Coefficients:1										
Total semester 3		30	16				330h00	330h00		

Semester 6:

Teaching units	Materials	Credits	Coefficient	Weekly hourly volume			VHS (14-16 weeks)	Other*	Evaluation method	
	Titled			Course	T	PW			Continuou s monitoring	Exam
Fundamental EUCode: UEF 3.2.1 Credits: 14Coefficients: 7	General hydraulics subject	8	4	3:h00	1h30	1h30	90h	90h	40%	60%
	Subject 2irrigation and drainage	6	3	1h30	1h30	1h30	67h30	67h30	40%	60%
Fundamental EUCode: UEF 3.2.2 Credits: 6Coefficients: 3	Subject 1: soil conservation	6	3	3h	1h30	1h30	67h00	67h00	40%	60%
EU methodologyCode: UEM 1.1Credits:2 Coefficients:2	Subject 1: agro meteorology	2	2	1h30			15H00	15H00		100%
UEmethodologyCode: UEM 2.1Credits:2 Coefficients:3	Subject 1: mineral nutrition and fertilization	2	3	1h30	1h30		22H30	22H30	40%	60%

Discovery EU Code: UED1 2.1Credits:4 Coefficients:2	Subject 1: machinery	2	1	1h30			15H00	22H30		100%
	Subject 2: agricultural project	2	1	1h30			15H00.	15H00		100%
Transversal EUCode: UET 1.1Credits:3 Coefficients:4	Subject 1: instrumental analysis	2	2	1h30			13H30	15H00.		100%
	Subject 2: end-of-study dissertation	1	2	13H30/1 5d		113H30/ 15d	9H00.	9H00	40%	60%
Total semester 3		30	21				337H30	337H30		

Overall summary of the training:

EU V.H.	UEF	EMU	UED	UET	Total
Course	651.9	171.9	127.3	75	1026.1
TUTORIALS	404.6	97.1	22.3	0	524
PW	404.2	22.3	45	7.3	478.8
other (explain, list,)	1236.9	339.6	145	107.3	1828.8
Total	2697.6	630.9	339.6	189.6	3857.7
Credits	128	28	15	9	180
% in credits for each EU	71.1%	15.5%	8.33%	5%	100%

III - Detailed program by subject for S5 semesters

Semester: 5
Teaching unit: UEF 1
Subject 1:GENERAL PEDOLOGY
Credits: 8
Coefficient:4

Teaching objectives: Acquisition of knowledge on soil constituents and their organization as well as the chemical and biological properties of soils and the different classifications available on soils.

Recommended prior knowledge:Ecology concepts

Content of the material:

Chapter 1: Introduction: Definition of soil and purpose of pedology

Chapter 2: The constituent elements of the soil

- 2.1. Mineral constituents
- 2.2. Organic constituents
- 2.3. Colloidal complexes

Chapter 3: The morphological organization of soils

- 3.1. Elementary organizations
- 3.2. The soil horizon
- 3.3. Soil profiles
- 3.4. Soil coverage
- 3.5. Soil and water
- 3.6. The soil atmosphere
- 3.7. Ground temperature
- 3.8. The color of the ground

Chapter 4: Chemical properties of soil

- 4.1. Ion exchange phenomena
- 4.2. Electroionic properties of soil

Chapter 5: Biological properties of soil

- 5.1. Soil organisms
- 5.2. Transformations of microbial origin

Chapter 6: Soil classification

- 6.1. Soil classification
- 6.2. The different classifications (Russian, American, French)
- 6.3. Algerian soils and their relationships with climate and geomorphology.

Chapter 7: Soil-vegetation relationships

Titles of the Tutorials:

- Ground system: three-phase system. Mass – Volume relationship. Start of physical analysis: porosity, permeability, apparent density and sieving of soils
- Structural and crystallochemical characterization of the main mineralogical species. Various types of clays.
- Method for studying clay minerals: RX, ATD, ATG, IR.

- Soil solutions (Liquid transfers in the soil: the equations of water flow in the soil.)
- The dynamics of ions in the soil: calcium-magnesium, sulfur, nutrition and physicochemical properties.
- The dynamics of ions in the soil: nitrogen, phosphorus, potassium.
- Algerian soils, use of various classifications, classification documents and cartography.
- Study of some classes of soils, calci-magnesian soils and ferralitic soils.
- Structure of minerals, clays, notions of crystallography.

Titles of the practical work:

- Field trip: description of some profiles and collection of samples for analysis.
- Analytical chemistry reminders.
- .- Calcimetry- active limestone.
- Nitrogen – carbon – pH.
- Study of the absorbent complex
- Complexometry: Ca⁺⁺ and Mg⁺⁺
- Photometry: Na⁺ and K⁺ exchange capacity.
- Granulometry.
- Study of salty soils.
- conductivity
- ion balance: Ca⁺⁺, Mg⁺⁺, Na⁺, K⁺, chlorides, sulfates, carbonates.
- Summary of results and interpretation.
- Determination of soil types.

Evaluation method:

Continuous: 2

Exam: 1EMD, 1TD and 1 TP exam

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

- Baize D., 1988 - Guide to current analyzes in pedology, INRA, Paris, 172 p.
- Baize D., & Jabiol B., 1995. Guide for the description of soils, Ed. Inra, Paris. 375 pp.
- Bonneau M. & Souchier B., 1994, Pedology, Constituents and Properties of the soil, Ed. Masson, 665p.
- Chamley, H. 2005. Basics of sedimentology, Ed. Dunod (Paris), 178p
- Girard, MC.; Walter, C.; Remy, JC; Berthelin, J; Morel, JL. 2005. - Soils and Environments. Dunod Paris, 816p.
- Mathieu C., 2003. Chemical analysis of soils: selected methods, Ed. Tec et Doc, 387p
- Mathieu C., 1998. Physical analysis of soils: selected methods, Ed. Tec et Doc, 275p.
- Pansu M, and Gautheyrou J., 2003. Soil analysis: mineralogical, organic and mineral, Ed. Springer, 993p

Semester: 5
Teaching unit: UEF 1
Subject 2:SOIL MAPPING
Credits: 4
Coefficient:2

Teaching objectives:Acquire processing techniques and processes that make it possible to understand and analyze geographic, cartographic or satellite information.

Recommended prior knowledge:Cartography concepts

Content of the material:

- Introduction

Chapter 1 :Mapping elements(cartographic objects and different types of maps)

- 1.1. Definition
- 1.2. Realization,
- 1.3. Use and study of maps.

Chapter 2 :Application examples

Ecological, geological mapping; forestry and agricultural developments; protection of natural environments, pollution, etc.

Chapter 3:Geographic Information System (GIS)

- 3.1. Definition of the GIS approach
- 3.2.Computer structure of a GIS: presentation of software and cartographic databases
- 3.3. The main steps in setting up a GIS.
- 3.4. Environmental case studies.

Chapter 4:Remote sensing

- 4.1. Introduction to space remote sensing.
- 4.2.Theoretical reminders of the physical bases of space remote sensing
- 4.3. Environmental techniques and applications: processing and interpretation of remote sensing documents: orthophotoplans, aerial photographs and satellite images

Evaluation method:

Exam: 1EMD

Reference:

Girard MC and Girard CM (1999) – Processing of remote sensing data. Ed. Dunod.
Drury SA (1998) - Images of the earth, a guide to remote sensing. Oxford Science Publishers.
Roller B. (2008) -Mapping method. Ed. CNRS.
Held J. (1992) – Cartography. Ed. Folle Avoine.
Girard MC and Girard CM (1999) - Processing of remote sensing data. Ed. Dunod.
<http://rst.gsfc.nasa.gov/start.html>: NASA Online Remote Sensing Course.
<http://www.research.umbc.edu/~tbenja1>: Online courses on aerial photos, remote sensing, image processing and Applications. By the University of Maryland and the University of California.
Landsat:<http://landsat7.usgs.gov/gallery/index.php>

SPOT: <http://www.spotimage.fr/accueil/>
<http://terra.nasa.gov/>,
<http://asterweb.jpl.nasa.gov/default.htm>

Semester: 5
Teaching unit: UEF 2
Subject 1:HYDROGEOLOGY
Credits: 6
Coefficient: 3

Teaching objectives: Allow students to have knowledge on the state of water in geological materials, properties of aquifer materials typology of acquired materials and underground flows

Recommended prior knowledge: Knowledge of basic hydrology and geology

Content of the material:

Chapter 1 :Definition: Advantage and Disadvantage of Groundwater

Chapter 2: Aquifer systems

Chapter 3: Fundamental law of groundwater flow.

Chapter 4: Fundamental equation of diffusivity in porous media

Practical work

- 1.- Measurement of permeability in the laboratory
- 2.- Measurement of permeability in the field

Tutorials

- 1.- DARCY's law: flow diagrams, real filtration speed
- 2.- Determination of the permeability coefficient:
 - Permeability at constant load
 - Permeability at variable load
- 3.- Average permeability of superimposed layers

Evaluation method:

1 EMD of 1.5 h, TD, continuous monitoring

References

- Hydrogeology and notions of Geology. Bogomolov. G
Website: [www. HYDROGEOLOGIE.com](http://www.HYDROGEOLOGIE.com)
[www. Univ-avignon.fr](http://www.Univ-avignon.fr) (website of the hydrogeology laboratory of the University of Avignon)

Semester: 5
Teaching unit: UEF 2
Subject 2:HYDROLOGY
Credits: 4
Coefficient:2

Teaching objectives:The course presents the fundamental notions of hydrology which allow students to master and understand the different functioning of hydrological processes in a watershed.

Recommended prior knowledge:Knowledge of geology, fluid mechanics, probability and statistics

Content of the material:

Chapter 1 :Introduction to hydrology

Chapter 2: Water cycle and hydrological balance

Chapter 3: The watershed and its complex

Chapter 4: Precipitation

Chapter 5: Infiltration and evaporation

Chapter 6: Flows

Evaluation method:

Exam: 1EMD

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

ANDRE MUSY & CHRISTOPHE HIGY (2004) Hydrology a natural science. Polytechnic and university press ROMANDES, 314p

JP LABORDE (200) Element of surface hydrology. University of Nice. 191p

Semester: 5

Teaching unit :UEM1

Subject 1:SPECIAL PHYTOTECHNY

Credits: 2

Coefficient: 2

Teaching objectives:

Content of the material:

Objective of the subject:

After having collected the basic notions of general pyrotechnics, comes this second part of special pyrotechnics which aims to allow the future licensee to know how to manage the main crops which occupy most of the Algerian UAS. This subject includes cereal growing, fodder and hoed plants.

Content of the subject

Course part

Chapter I: Cereal production and harvesting techniques

- Cereal species: soft wheat, durum wheat, barley, triticale, etc.
- Case study: Soft wheat cultivation

Chapter II: Fodder production and harvesting techniques

- Prairie plants, and the exploitation of prairies
- Fodder crops and harvesting and conservation methods

Chapter III: Production and harvesting techniques for weeded plants

- Industrial crops
- Food legumes (dried vegetables)

Chapter IV: arboriculture and viticulture

Chapter V: Pheoniculture

Chapter VI marichaire cultures

Evaluation method:

A medium-length exam(EMD).

Semester: 5
Teaching unit :EU methodology
Subject 2:CROP PROTECTION
Credits: 2
Coefficient: 1

Teaching objectives:

Knowledge of the basics of diagnosis and plant protection

Content of the material:

Introduction

I. Main control methods

II. General principles of phytosanitary control

III. The main diseases and pests of the date palm

IV. the main diseases and pests of fruit trees

V. the main diseases and pests of market gardening

VI. the main diseases and pests of field crops

Evaluation method:

A medium-length exam(EMD).

Semester: 5

Teaching unit :UED

Subject 1:FORESTRY

Credits: 1

Coefficient: 1

1.MODULE OBJECTIVES:The silviculture module is introduced into the agronomic license program in order to provide students with the basic concepts of general silviculture such as forest ecosystem, dendrology, reforestation, regeneration method.....etc. These concepts are the elementary principles which make it possible to establish a development in a natural (forest) environment.

2. MODULE CONTENT:

CHAPTER I-Notions about trees and forestry.

- 1)-Definition of forestry.
- 2)-Explanation of some technical terms.
- 3)-Role of the forest and the different types of forest
- 4)-Current state of the Algerian forest.
- 5)-Distribution of forest species according to the altitude of the main Algerian regions

CHAPTER II- Forest ecology

- 1)-Definition of the forest ecosystem.
- 2)-Objectives of forest ecology
- 3)-Study of the main factors influencing forest life.

CHAPTER III-Forest dendrology.

- 1)-Introduction to dendrology.
- 2)-Definition of forest species (native, exotic, etc.)
- 3)-Importance of morphological characters for tree recognition.

CHAPTER IV: Practice of silviculture

- 1) Introduction (determine the purpose of forestry).
- 2)- Qualitative study of the populations.
- 3)- Quantitative study of the forest population.
- 4)-Improvement operations
- 5)-Regeneration methods.
- 6)-Exploitation of cuts

Evaluation method:

A medium-length exam(EMD).

Semester: 5

Teaching unit :Transversal EU

Subject 2:ZOOTECHNY

Credits: 2

Coefficient: 1

Teaching objectives:Teach the student to know the different breeds of cattle, sheep and goats as well as the techniques for managing ruminant breeding

Content of the material:

Chapter 1: Cattle breeding

1. Cattle breeds in the world and in Algeria
2. Dairy production and control
3. Meat production

Chapter 2: Sheep breeding

1. Sheep breeds in the world and in Algeria
2. Livestock systems in Algeria
3. Sheep production

Chapter 3: Goat breeding

1. Goat breeds in the world and in Algeria
2. Livestock systems in Algeria
3. Dairy production and control

Chapter 3: Poultry farming

Chapter 3: Rabbit farming

Evaluation method:

A medium-length exam(EMD).

III - Detailed program by subject for S6 semesters

Semester: 6

Teaching unit: UEF 1

Subject 1:GENERAL HYDRAULIC

Credits:8

Coefficient:4

Teaching objectives:Acquire the necessary theoretical bases in different areas of agriculture in general and agricultural hydraulics in particular, areas ranging from pressure (manometers, tensiometers, etc.), to water supply and evacuation in the event of excess (pipes, canals, irrigation and drainage systems, flow measurements, ancillary hydrotechnical works, etc.),

Recommended prior knowledge:Knowledge of physics and fluid mechanics

Content of the material:

Chapter 1 :Hydrostatic (Reminder)

Chapter 2 :Pressure force of a liquid on a surface

Chapter 3:Fundamental hydrodynamic equations

Chapter 4:Liquid flow regimes:

4.1. In closed pipes

4.2. In the open canals

Tutorials

A tutorial for each chapter

Practical work

- Flow measurement
- Flow in open channels

Evaluation method:

1 EMD of 1.5 hours, TD exam, TP exam, continuous assessment

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

General hydraulics. Ed. Eyrolles. 633p - 1999

Physical hydrodynamics, Ed. EDF Sciences/ Guyon E., Hulin JP& Pariz

Fluid mechanics, courses and corrected exercises. Ed. Dunod/ JL Battaglia, S. Amiroudine

Semester: 6

Teaching unit: UEF 1

Subject 2: IRRIGATION AND DRAINAGE

Credits: 6

Coefficient: 3

Teaching objectives: Introduction of students to irrigation management and preliminary calculations for irrigation projects. The objective is to explain to students the design of horizontal drainage in shallow soil. Definitions will be given on the drainage methods, the network and its components and the studies necessary for the projection of a drainage network. A part is devoted to the fight against salinity, particularly on techniques for leaching agricultural soils.

Recommended prior knowledge: Knowledge of pedology, plant physiology and basic hydraulics

Content of the material:

I - FUNDAMENTAL BASIS OF IRRIGATION

Chapter 1: Water in irrigation

Chapter 2: Basic irrigation techniques

Chapter 3: rational management of irrigation.

Chapter 4: Study of the irrigation project.

II - FUNDAMENTAL BASIS OF DRAINAGE

Chapter 1: Agricultural drainage, definition and basic principle

Chapter 2: The drainage network and its components

Chapter 3: Study to be carried out for the design of a drainage network.

Tutorials

1 - Calculation of an irrigation project

2.- agricultural drainage and excess water

has. calculation of characteristic flow

b. calculation of flows and steady state and variable regime

vs. Choice of length and depth of drainage

Practical work

1.- Measuring soil moisture (different methods)

2.- Measurement of the apparent density of the soil

Exit

Visit to an irrigated area

Visit to a drainage site or a company specializing in the field.

Evaluation method:

2 EMD of 1.5 hours, 1 TD&TP exam, continuous assessment

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

Ollier, C., Poirée M. (1986). Irrigation. Irrigation networks: theories, techniques and economics of watering. Eyrolles, Paris, 503 p.

Mathieu C., Audove P., JC Chossat (2007). Technical bases of sprinkler irrigation. Ed. Tech and Doc – Lavoisier

FAO (2008). Manual of pressure irrigation techniques (308 p)

Website: www.FAO.org

Agricultural Drainage: Theory and practice / Concaret J. (1981)

Drainage and Agricultural Land Sanitation / L. Faure (2011)

Semester: 6

Teaching unit: UEF 2

Subject 1: SOIL CONSERVATION

Credits: 6

Coefficient: 3

Teaching objectives:

This concerns the protection of soil and land resources, knowing that soil is a non-renewable resource.

2 MODULE CONTENT

HAS. COURSE

CHAPTER I: THE PHENOMENON OF EROSION

- 1-Erosion factors
- 2-The mechanisms
- 3-Study methods
- 4-The results

CHAPTER II: WATER AND SOIL CONSERVATION METHODS

- 1-Biological and cultural methods
- 2-Mechanical methods
- 3-Watershed development

b. TUTORIALS

- Case study
- Erosion pre-detection method
- Quantification method

3 KNOWLEDGE CONTROL MODE

- Course: 2 EMD
- Tutorials: 1 EMD

Calculation of the average: $(EMD1+EMD2+EMD TD) A3$

IV- Agreements / Conventions

STANDARD LETTER OF INTENT

(In case of license co-sponsored by another academic establishment)

(Official paper on the header of the university establishment concerned)

Subject: Approval of co-sponsorship of the license entitled:

The university (or university center) hereby declares to co-sponsor the license mentioned above throughout the license authorization period.

To this end, the university (or university center) will assist this project by:

- Giving his point of view in the development and updating of teaching programs,
- Participating in seminars organized for this purpose,
- By participating in defense juries,
- By working to pool human and material resources.

SIGNATURE of the legally authorized person:

FUNCTION :

Date :

STANDARD LETTER OF INTENT

(If licensed in collaboration with a user sector company)

(Official company letterhead)

OBJECT :Approval of the project to launch a License training course entitled:

Provided to:

The company hereby declares its willingness to demonstrate its support for this training as a potential user of the product.

To this end, we confirm our support for this project and our role will consist of:

- Give our point of view in the development and updating of educational programs,
- Participate in seminars organized for this purpose,
- Participate in defense juries,
- Facilitate as much as possible the reception of interns either as part of end-of-study dissertations or as part of tutored projects.

The means necessary to carry out the tasks incumbent on us to achieve these objectives will be implemented on a material and human level.

Mr. (or Madam)*is designated as external coordinator of this project.

SIGNATUREof the legally authorized person:

FUNCTION :

Date :

OFFICIAL STAMP or COMPANY SEAL

V – Brief CV
From the teaching team mobilized for the specialty
(Internal and external)
(according to attached model)

Brief CV

First and last name :

Date and place of birth :

Email and telephone:

Grade :

Establishment or institution of connection:

Diplomas obtained (graduation, post-graduation, etc.) with date and place of obtaining and specialty:

Professional teaching skills (subjects taught, etc.)

(Only in the final version sent to the MESRS)

**VIII – Opinion and Visa of the National Educational Committee of the
Domain**

(Only in the final version sent to the MESRS)