

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

**MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH**

HARMONIZATION OFFER OF ACADEMIC MASTER TRAINING

Establishment	Faculty / Institute	Department
Djillali Bounaama University of Khemis Meliana	Nature and Life Sciences, and Earth Sciences	Biology

Domain : Nature and Life Sciences

Sector : Biological Sciences

Speciality : Applied Microbiology

Academic year: 2016 / 2017

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي

مواصلة
عرض تكوين ماستر
أكاديمي

القسم	المعهد/الكلية	المؤسسة
البيولوجيا	علوم الطبيعة و الحياة و علوم الارض	جامعة جيلالي بونعامه خميمس مليانة

الميدان : علوم الطبيعة و الحياة

الشعبة : علوم بيولوجية

التخصص : الميكروبيولوجيا التطبيقية

السنة الجامعية: 2016-2017

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I – Master's identity card

1 - Training location:

Djillali Bounaama University of Khemis Miliana

Faculty: Nature and Life Sciences, and Earth Sciences (NLS. ES)

Department : Biology

2- Training Partners *:

- Others academics establishments :
 - University of chlef
 - University of Blida.
 - University of Tlemcen, in co-sponsorship with Applied Microbiology Laboratory
 - University of Bejaia.
- Companies And others social economic partners:
 - Research laboratory: Valorization of Natural Substances of Khemis Miliana University
 - Laboratory of research : Water, rock and plant of Khemis-Miliana university.
 - Research Laboratory: Agricultural production and sustainable development of natural resources of Khemis Miliana University.
 - Laboratory of Applied Microbiology to Agrifood, Biomedical and environment (LAMAABE) of Tlemcen University.
 - Laboratory of Biochemistry, Biophysics, Biomathematics And Scientometrics (L3BS) of Bejaia University.
 - Pastor Institute from Algiers.
 - Waniss Dairy, Khemis Miliana.
 - ARIBS Dairy from Aïn Defla.
 - Laboratories of the hospitals (Khemis Miliana, Miliana, Aïn Defla).
 - Laboratory of Medical Analyzes Dr. Zibouche.
 - Direction of the environment.
 - Direction of the Agricultural Services (DSA).
 - Health And Population Direction.
 - SAIDAL (Medea).
- International partners :
 - None.

* = Conventions are presented in appendix of the training

3 – Context and objectives of training

A – Access conditions:

The applied Microbiology Master is focused on the needs of the product Industry - Research, and is intended for Licensees of the LMD training in:

- General Microbiology
- Applied Microbiology

Students with a Bachelor's degree and/or DES (former system) "Food microbiology, applied microbiology,...) or other specialties directly related to Microbiology, will have the opportunity to continue their studies in Applied microbiology Master according to eligibility criteria (classification, upgrading, equivalences, etc.)

Direct access to Master 2 (upgrade) for holders of an engineering degree or equivalent recognized diploma (Bac +05) in microbiology or other related specialty of Microbiology.

B - Training aims:

The main orientations of the teaching program are: microbiological engineering in the broad sense, agro-food and environmental microbiology and the control of microbial agents in terms of growth, survival, inhibition or elimination. The applications will concern microflora of technological interest as well as spoilage or pathogenic microflora. The notions of hygiene and health safety and the control of environmental risks are also covered in this training.

The Applied Microbiology Master aims to pool all the basic and applied sciences related to: biology, microbiology and biochemistry, making it possible to understand and deal with certain difficulties related to the specialty :

- 1- Acquisition of knowledge on food and/or pharmaceutical products and the processes of manufacturing.
- 2- Mastery of analytical techniques and methods related to agri-food, the environment and biomedical.
- 3-Hypothesis formulation and experimental validation.
- 4-Acquire skills to manage analysis and control laboratories
- 5-To offer a multidisciplinary education dealing with issues related to Microbiology with a view to preparing for a professional career.

C – Profiles and targeted skills:

The major interest of the training offer of Applied Microbiology Master is to provide fundamental and applied knowledge to our students in an environment rich in agro-food industries, and to compensate for the training of the old system. by giving an educational product taking into account the advantages and disadvantages encountered during previous training (DEUA, DEUS, Engineer, etc.).

The architecture of the teaching units and their chronology during M1 and M2 is made in such a way that students with biological training profiles can access this course.

In addition, this specialty provides training for biologists with excellent professional knowledge in such varied fields. The diversity of the modules offers the student a training that prepares him for careers in fundamental or industrial research, public or private.

The main career opportunities are:

1. In the fields of pharmaceutical research
2. In the field of private or public agro-food industries.
3. In the field of health (medical analysis laboratories) private or public.
4. Opening of Quality Control and Analysis Laboratories.
5. Expertise and Quality Control

The Applied Microbiology specialty responds to a need expressed by both students and industrialists in the concerned sectors. The most promising sectors concern health safety, control of microbial development, microbial ecology studies, creation of new agri-food products, environmental protection, water, soil or air pollution.

D- Regional and national potentialities employability:

The Wilaya of Ain Defla, with its agricultural vocation and its large agri-food industry, offers an ideal framework for internships and dissertations in companies,

This training also participates in the creation of employment positions in economic and social sectors as well as health in:

- Food industry laboratories;
- Hospitals laboratories;
- Hydraulics laboratories;
- Agro-food industry;
- Pharmaceutical production companies;
- Water services;
- Environmental services;
- Quality and control inspections;
- Pasteur Institute;
- Border posts (Inspection of imported products).

E – Gateways to others specialties:

At the end of their training, students graduate in License “Microbiology, Applied Microbiology, Fundamental Microbiology, Food Microbiology, Environmental Microbiology, Clinical Microbiology, Biological and Biochemical Analysis, Food Quality Control... » will have the opportunity to continue their studies in the same Master’s degree in “Applied Microbiology” or to move towards other Masters close to this one such as the Masters in: Fundamental Microbiology, ...

The Master in Applied Microbiology offers the possibility of preparing a Doctorate in the options of: Food and Industrial Microbiology, Microbiology and Health, Environmental Microbiology, Applied Microbiology, etc.

F- Indicators of follow up of training:

The training management team is made up of specialist teachers in the field to ensure that the training runs smoothly; the availability of material resources such as the various educational laboratories (Microbiology laboratory, Biochemistry laboratory and Chemistry laboratory, etc.) or research with adequate equipment.

The methods of knowledge control (final exam, questioning in tutorials, exit or practical work report, presentations, etc.) comply with the regulations in force. There is compensation between subjects within the teaching unit and compensation between teaching units per semester. A remedial session in the form of a written document is planned for all the teaching units not acquired at the end of the semester.

The end-of-study internship is an impregnation of the student to his future profession and also constitutes a first professional experience.




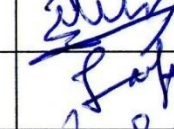


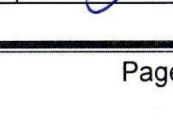

An Academic Master's Degree in Applied Microbiology will be awarded to the student.

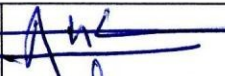

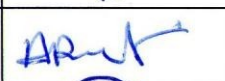

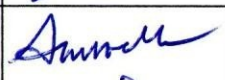

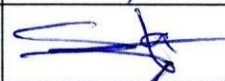


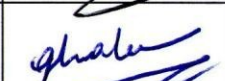


G – Supervisory capacities:

The average number of students that can be accommodated is 25 students.

4 – Moyens humains disponibles

A : Enseignants de l'établissement intervenant dans la spécialité :

Nom, prénom	Diplôme graduation + Spécialité	Diplôme Post graduation + Spécialité	Grade	Type d'intervention *	Emargement
LAZALI Mohamed	Ingénieur en Agronomie	Doctorat en science agronomique	MCA	Cours, TD, TP, Encadrement	
GUETARNI Hacina	Ingénieur en Science Alimentaire	Doctorat en Microbiologie	MCB	Cours, TD, TP, Encadrement	
AIT OUZZOU Abdenour	Ingénieur en Agronomie	Doctorat en Bioconservation des aliments	MCA	Cours, TD, TP, Encadrement	
AOUN Omar	Master en Biotechnologie	Doctorat en sciences alimentaires	MCA	Cours, TD, TP, Encadrement	
MAROUK Mohamed Amine	Ingénieur en Agronomie	Doctorat en Sciences agronomiques	MCB	Cours, TD, TP, Encadrement	
MAHI Miloud	DES en Microbiologie	Magister en Microbiologie alimentaire	MAA	Cours, TD, TP, Encadrement	
GHOZLANE Mohamed Khalil	Docteur vétérinaire	Magister en Sciences vétérinaires	MAA	Cours, TD, TP, Encadrement	
TAHAR Kara Hacem	Ingénieur en Agronomie	Doctorat en Sciences Agronomiques	MAA	Cours, TD, TP, Encadrement	
MEKHATI Mohamed	Ingénieur en Agronomie	Magister en Sciences agronomiques	MAA	Cours, TD, TP, Encadrement	
SAADI Fadhila	Ingénieur en science alimentaire	Magister en sciences alimentaires	MAA	Cours, TD, TP, Encadrement	
DIDOUH Nassima	Master en Microbiologie	Doctorat en Biologie moléculaire et biochimique	MCB	Cours, TD, TP, Encadrement	

DAOUDI Ahlem	Ingénieur en science alimentaire	Magister en sciences alimentaires	MAA	Cours, TD, TP, Encadrement	
GHOMARI Faïza Nawel	DES en Microbiologie	Magister en Microbiologie appliquée	MAA	Cours, TD, TP, Encadrement	
ROUABEH Abdelkader	Docteur Vétérinaire	Magister en science vétérinaire	MAA	Cours, TD, TP, Encadrement	
BOURAS Hacem	DES Biochimie	Magister en Microbiologie	MAA	Cours, TD, TP, Encadrement	
AMROUCHE Zouhir	Ingénieur en Science alimentaire	Magister en Microbiologie	MAA	Cours, TD, TP, Encadrement	
SAHRAOUI Abdelhamid	DES Biologie animale	Magister en Physiologie animale	MAB	Cours, TD, TP, Encadrement	
MOSTEFA Sari Fouzia	Ingénieur en génie Biologie	Magister en Biotechnologie	MAB	Cours, TD, TP, Encadrement	
BRAHIMI Samira	DES en Biotechnologie	Magister en Microbiologie	MAB	Cours, TD, TP, Encadrement	
BOUSSOUBEL Abdelkader	DES en Biologie animale	Magister en Biologie Moléculaire	MAA	Cours, TD, TP, Encadrement	
GHALEM Meriem	Master en Physiologie cellulaire et physiopathologie	Doctorat en Biologie cellulaire et Biochimie de la nutrition	MCB	Cours, TD, TP, Encadrement	
AROUS Ali	DES en Biologie Végétale	Magister en Ecophysiologie végétale	MAA	Cours, TD, TP, Encadrement	
DIDAQUI	DES Biochimie	Magister en Biologie moléculaire et immunologie	MAA	Cours, TD, TP, Encadrement	

* = Cours, TD, TP, Encadrement de stage, Encadrement de mémoire.

5 – Available specific material resources

A- Educational Laboratories And Equipment : Sheet of existing educational equipment for the practical work of the planned training

Title of the laboratory: Microbiology
ability in students: 20

No.	Entitled of equipment	Number	Observation
01	Magnetic agitator	02	Good state
02	Agitator vortex	03	VELP, Good state
03	Autoclave	04	witeg [38047/14] CertoClav [MC1619] Good state
04	Water bath	02	Memmert[1204-096A], Witeg[38031/14], Good state
05	Analytic balance	02	KERN [2170-9/10], OHAUS[38048/14] , Good state
06	Refrigerated centrifuge	01	SIGMA[38049/14] Good state
07	Micro-centrifuge	01	Good state
08	Counter of colonies	01	BioBlock [6497] Good state
09	Freezer ultra-low	01	Platilab370H] Good state
10	Stiller in stainless steel	01	GFL[38035/14] Good state
11	Steamroom	01	Witeg[38033/14] Good state
12	Flow laminar vertical hood	01	BIOBASE [38045/14] Good state
13	Anaerobic incubator	01	Good state
14	Bacteriological incubator	04	Memmert (02)[12914/07], JOWAN [12914/07], witeg [38032/14] Good state
15	Binocular magnifying glass	02	Motic [50943082-50848877]
16	Micro-pipette 1000µl, 10-100µl, 5-50ul	04	Good state
17	Fixed micro-pipette of 50ul, 100µl, 25µl, 5000µl, 10000µl	05	Good state
18	Variable volume micropipette of 10-100µl, 50-200µl, 20-200µl, 100-1000µl.	04	Good state
19	Optical microscope	15	Good state
20	Microscope ZESS	03	Good state
21	Digital pH meter	01	Good state
22	pH meter	02	Mettler Toledo[1230175332 Good state
23	Hot plate with stirrer	03	VMS-A[017747787], VELP [12906/07] Bansen SA[19947/09] Good state
24	Fridge	03	Good state
25	Stereo microscopes	02	OPTIKA [38034/14] Good state
26	Thermocycler	01	Good state
27	Cooling system	01	Good state

**Title of the laboratory: Microbial biochemistry
ability in students: 20**

No.	Entitled of equipment	Number	observations
1	hood Sorbola	(01)	Good state
2	Analyzer of chlorine (comparator set)	(01)	Good state
3	Water bath	(02)	Good state
4	Sand water bath	(01)	Good state
5	Precision scales 1000g, 10g, 1200 g	(03)	21713/10, Good state
6	Centrifuge	(01)	12482/001787, Good state
7	Heated ball	(03)	483/05.13860/08, Good condition
8	conductivity meter	(01)	21703/10.3268, Good state
9	Colorimeter	(01)	420/05, Good state
10	Desiccator	(01)	Good state
11	hydrometer 1400/1500, 2000	(04)	Good state
12	Distributer 5ml	(01)	Good state
13	Electrophoresis (vertical)	(02)	Good state
14	Steamroom	(01)	Good state
15	Hematocrit	(01)	8963/04, Good state
16	Lactodensimeter	(01)	Good state
17	microscopes	(07)	21660.21661.21668.216669/10, Good state
18	pH meter	(03)	294/05.13891/08, Good condition
19	Stirrer	(02)	287/05.19946/09, Good condition
20	Steamroom Universal 250°C	(01)	Good state
21	Viscometer	(01)	Good state
22	Complete CHAIN ELISA	(01)	Good state
23	Magnetic heated plaque	(01)	Good state
24	Optical device for measuring the size zones of inhibition	(01)	Good state
25	Centrifuge Gerber louse milk	(01)	Good state
26	Tanks vertical double cooling electrophoresis Kuro Freeze Verti	(01)	Good state
27	Kuro Gel Maxi plus horizontal tank 25	(01)	Good state
28	Generator electrophoresis	(01)	Good state

Laboratory title: Food microbiology laboratory**Ability in students : 20**

No.	Entitled of equipment	Number	Comments
01	Ovens	03	Good state
02	Marie Bath	01	Good state
03	Laminar flow hood	01	Good state
04	Laminar flow UV hood	01	Good state
05	Centrifuge	01	Good state
06	Spectrophotometer UV-visible	01	Good state
07	Desiccator	01	Good state
08	photonics microscopes	06	Good state
09	pH meters of bench top	01	Good state
10	Precision Balance	01	Good state
11	analytic Balance	02	Good state
12	Decrease temperature refrigerators (-80°C))	01	Good state
13	Freezer	02	Good state
14	Pump To empty	01	Good state
15	freeze dryer	01	Good state
16	rotavapor	01	Good state
17	Agitator plate	01	Good state
18	Heating stirrer	01	Good state
19	pH meters	02	Good state
20	Pasteur oven	01	Good state
21	Binocular magnifier	02	Good state
22	Distributer doser	02	Good state
23	Thermocycler	01	Good state

Lab title: Chemistry 1**Ability in students:20**

No	Entitled of equipment	Number	Observation
01	Apparatus for expansion of liquids	(01)	
02	Device of kjeldahl	(01)	Broken-down
03	Melting point apparatus	(01)	Good state
04	Apparatus for gas expansion	(01)	Good state
05	Magnetic baguette	(05)	Good state
06	Marie Bath	(01)	Good state
07	Sand bath	(01)	<i>Broken-down</i>
08	Electronic balance	(02)	A is broken
09	Analytic balance	(01)	Good state
10	Magnetic bar	(05)	Good state
11	Bunsen burner	(02)	Good state
12	Pharmacy box	(01)	Good state
13	Rubber stopper	(05)	Good state
14	Metallic capsule	(02)	Good state
15	Calorimeter	(09)	Broken-down
16	Heated ball	(03)	A is broken
17	Stopwatch	(02)	Broken-down

18	conductivity meter	(03)	Good state
19	portable conductivity meter	(02)	A is broken
20	Distiller	(03)	two In breakdown
21	Practical chemical safety documents	(01)	Good state
22	Steamroom	(02)	A is broken
23	Glove anti-heat	(01)	Good state
24	Aspergillum flexible	(02)	Good state
25	Analytic balance max650g	(1)	Good state
26	shaker	(03)	Good state
27	Gauze mask	(05)	Good state
28	Mortar " big and small »	(03)	Good state
29	Clamping nut	(10)	Good state
30	Vernier caliper	(1)	Good state
31	pH meter	(03)	Good state
32	Portable pH meter	(01)	Good state
33	Flame photometer	(02)	Broken-down
34	Clamp of tightening	(03)	Good state
35	Balloon clamp	(01)	Good state
36	Beaker clamp	(01)	Good state
37	wooden pliers	(05)	Good state
38	wash bottle in plastic 1000 ml	(03)	Good state
39	wash bottle in plastic 100 ml	(02)	Good state
40	Hotplate	(02)	Good state
41	Pear for pipette	(09)	Good state
42	Vacuum pump	(01)	Good state
43	Connection of T-junction	(01)	Good state
45	Refrigerant	(02)	Good state
46	Metallic spatula	(03)	Good state
47	Support for electrode	(01)	Good state
48	Support for test tubes	(04)	Good state
49	Support for burette with rod	(12)	Good state
50	Support for pipettes	(01)	Good state
51	Mercury thermometer	(09)	Good state
52	Electric thermometer	(04)	Good state
53	Immersion heater	(02)	Good state
54	Cloth metallic	(03)	Good state
55	Tripod	(03)	Good state
56	Valet in rubber	(01)	Good state
57	Cylinder metallic	(04)	Good state
58	Extractor	(01)	Good state
59	Ball holder	(01)	Good state
60	Metallic cylinder for soil analysis	(10)	Good state
61	Multi-parameter	(02)	Good state
62	Pipette Pump 25 ml	(01)	Good state
63	Robinson pipette support	(1)	Good state
64	Box of different soils (18vial)	(02)	Good state
65	Auger	(02)	Good state
66	Bernard calcimeter	(02)	one is broken
68	Sieve of (2 - 0.25 - 0.125 - 0.045-1-0.5-1.6-0.2) mm		Good state

Lab title: Chemistry 2**Ability in students:20**

N°	Entitled of equipment	Number	Observation
01	Hood	(01)	Good state
02	Heating stirrer	(01)	Good state
03	Hydrodistillation apparatus	(02)	Good state
04	Apparatus for gas expansion	(01)	Broken
05	Apparatus for the expansion of liquids	4671	Good state
06	Precision scale	(02)	Good state
07	pH strip (0-14)	(01)	Good state
08	Mercury barometer	(01)	Good state
09	Magnetic bar	(03)	Good state
10	Bunsen burner	(05)	Good state
11	Plastic container	(01)	Good state
12	Dissecting box	(01)	Good state
13	Pharmacy box	(02)	Good state
14	Carboy for distilled water	(01)	Good state
15	Calorimeter	(05)	Good state
16	Centrifuge	(01)	Good state
17	Balloon heater	(06)	Good state
18	Stopwatch	(05)	Good state
19	Colorimeter	(01)	Good state
20	Conductivity meter	(02)	Good state
21	Portable conductivity meter	(01)	Good state
22	Plastic trash can	(02)	Good state
23	Chromatography tank	(04)	Good state
24	hydrometer	(04)	Good state
25	Desiccator	(01)	Good state
26	Distiller	(01)	Good state
27	Practical chemical safety documents	(01)	Good state
28	Elevator	(01)	Good state
29	Rotary evaporator	(01)	Good state
30	Water jerrycan	(02)	Good state
31	Extraction assembly	(01)	Good state
32	Clamping nut	(02)	Good state
33	portable pH meter	(01)	Good state
34	pH meter	(05)	Good state
35	wooden clamp	(05)	Good state
36	Beaker clamp	(02)	Good state
37	Burette clamp	(09)	Good state
38	Plastic wash bottle	(09)	Good state
39	Bulb for pipette	(02)	Good state
40	Vacuum pump	(02)	Good state
41	Pipette holder	(01)	Good state
42	Tube holder	(03)	Good state
43	Archimedes thrust	(01)	Good state
44	Sprayer	(01)	Good state
45	Refrigerant	(02)	Good state

46	Set sealing	(02)	Good state
47	Source from cold light	(01)	Good state
51	Spatula in stainless steel	(03)	Good state
52	Support burette with stem	(06)	Good state
53	Support for electrode	(01)	Good state
54	Thermometer	(03)	Good state
55	Thermometer of alcohol	(02)	Good state
56	Thermometer of mercury	(02)	Good state
57	Thermometer of poached	(02)	Good state
58	Thermometer t°800 at 950°	(02)	Good state
59	Immersion heater	(01)	Good state
60	Cloth metallic	(05)	Good state
61	Tripod for spout	(06)	Good state
62	Shaped tube U	(02)	Good state
63	Volume identical	(01)	Good state
64	Vortex	(01)	Broken-down
01	Ampule of decant 250 ml	(02)	Good state
02	Baguette in glass	(05)	Good state
03	Ball 500 ml	(06)	Good state
04	Ball tri collar	(01)	Good state
05	Ball to distillation	(02)	Good state
06	Beaker 50ml	(10)	Good state
07	Beaker 100ml	(09)	Good state
08	Beaker 250ml	(10)	Good state
09	Ball in 2mm glass	0.8kg	Good state
10	Ball in 4mm glass	0.5kg	Good state
11	Jars in glass	(05)	Good state
12	Cruet 25 ml	(02)	Good state
13	Cruet 50 ml	(04)	Good state
14	Capsule diameter 100	(02)	Good state
15	Capsule diameter 50	(02)	Good state
16	Crystallizer 300 ml	(03)	Good state
17	Funnel Buchner in glass	(02)	Good state
18	Funnel Buchner in porcelain	(01)	Good state
19	Funnel Ø 55mm	(05)	Good state
20	Funnel Ø 70mm	(05)	Good state
21	Test piece in PVC 100 ml	(05)	Good state
22	Test tube in PVC 50ml	(05)	Good state
23	Test tube in glass 100 ml	(06)	Good state
24	Test tube in glass 50 ml	(06)	Good state
25	Test tube in glass 10 ml	(09)	Good state
26	Vacuum flask 500ml	(01)	Good state
27	Vacuum flask 250ml	(01)	Good state
28	Volumetric flask 1000 ml	(02)	Good state
29	Volumetric flask 500 ml	(06)	Good state
30	Volumetric flask 100 ml	(10)	Good state
31	Volumetric flask 50 ml	(14)	Good state
32	500ml bottle	(08)	Good state
33	250ml bottle	(04)	Good state
34	Separator poly	(01)	Good state

35	Graduated Pipette 5 ml	(04)	Good state
36	Graduated Pipette 2 ml	(08)	Good state
37	Graduated Pipette 1 ml	(06)	Good state
38	Volumetric pipette 5 ml	(06)	Good state
39	Volumetric pipette 2 ml	(05)	Good state
40	Volumetric pipette 1 ml	(05)	Good state
41	Watch glass Ø 80mm	(11)	Good state
42	Watch glass Ø 100mm	(10)	Good state

Lab title: Chemistry 3

Ability in students:20

No.	Entitled of equipment	Number	Observation
01	Stirrer of helix	01	Good state
02	alcoholmeter in glass	01	Good state
03	Marie bath	01	Good state
04	Magnetic baguette	02	Good state
05	Analytic balance	01	Good state
06	Balance scope 200g	01	Broken
07	Balance scope 400g	01	Good state
08	Magnetic bar	02	Good state
11	Digital stopwatch	03	Good state
12	Manual conductivity meter	01	Broken
13	BOD meter with 06 vials	01	Good state
14	COD meter with tube for COD	01	Good state
15	Distiller	01	Good state
16	Elevator	01	Good state
17	Drainer	01	Good state
18	Oven of calcination	01	Broken
19	Test tubes of metals	01	Good state
20	Steamroom	01	Good state
21	Mortar	01	Good state
22	Multi parameter	03	Good state
23	Nut of Tightening	12	Good state
25	Manual pH meter	02	Good state
26	pH palisade meter	03	02 broken
27	Flame photometer	01	Good state
28	Heated plaque	03	One broken
29	Door pipette	01	Good state
30	Clamp for beaker	03	Good state
31	Clamp for ball	01	Good state
32	Pump To empty	02	Good state
33	Refrigerant	04	02 broken
34	Resistance	01	Broken
35	Metallic Spatula	02	Good state
36	Support for probes	01	Good state
38	Thermometer some water	04	Good state

39	Immersion heater For Bath Husband	01	Good state
42	Turbidimeter	02	Good state
43	Device For dilation liquid	01	Good state
44	Device For pressure atmospheric	01	Good state
45	Barometer	01	Good state
46	Romp of filtering	02	Good state

Title of the laboratory: Animal biology

ability in students:20

No.	Entitled of equipment	Number	Observation
45	Box of prepared blade of zoology		Good state
46	Box of prepared blade of histology		Good state
47	Box of prepared blade of botany		Good state
48	conductivity meter		Good state
49	Dissecting bowl		Good state
50	Steamroom		Broken
51	Drainer		Good state
52	Drainer		Good state
53	Hygrometer For bedroom breeding		Good state
54	Genetic of the fruit flies (05problems in plates)		Broken
55	Binocular magnifier (17)		Good state
56	Sex-linked inheritance F1		Good state
57	Sex-linked inheritance F2		Good state
58	Halogen lamp		Good state
59	Hand magnifier		Good state
60	Hand magnifier		Broken
61	Cryostat		Good state
62	Genetics of Drosophila mono hybridisms		Good state
63	Genetics of Drosophila di hybridisms		Good state
64	Steamroom		Good state
65	Drainer		Good state
66	Hygrometer For bedroom breeding		Good state
67	Genetics of fruit flies (05problems in plates)		Broken
68	DNA mockup (big format)		Good state
69	Model of DNA udder		Good state
70	Cellular division model (12)		Good state
71	Microscopes (14)		Broken
72	Micrometer		Good state
73	Microtome		Good state
74	Microtome		Good state
75	Micropipette 1000ul		Good state

76	Micropipette 1000ul		Good state
77	Micropipette 20-200 ul		Broken
78	Micropipette 100ul		Good state
79	Micropipette 10ul		Good state
80	pH meter		Good state
81	Hotplate		Good state
82	Hotplate		Good state
83	Hotplate		Good state
84	Pedagogic plank		Broken
85	Cork dissection plate		Good state
86	Pipette door		Good state
87	Wood rack		Good state
88	Metal rack		Broken
89	steroscope		Good state
90	Human skeleton		Good state
100	Burette Support		Good state
101	Sieve support		Good state
102	Sieve support		Good state
103	Sieve support		Broken
104	Sieve support		Good state
105	Sieve		Good state
106	Sieve		Good state
107	Sieve		Good state
108	Thermometer		Good state
109	Porcelain mortar		Good state

Title of the laboratory: Environment
Ability in students:20

No.	Entitled of equipment	Number	Observation
1	overhead projector	(01)	Good state
2	Dissection box		Good state
3	Flask 250 ml	(02)	Good state
4	Flask 500 ml	(01)	Good state
5	Flask 1000 ml	(01)	Good state
6	Test tube 50 ml	(01)	Good state
7	funnel	(05)	Good state
8	Pipette 5 ml	(01)	Good state
9	Pipette 1 ml	(02)	Good state
10	2 cruets + support		Good state
11	Test tube 50 ml	(02)	Good state
12	Test tube 25 ml	(01)	Good state
13	Beaker 50 ml	(02)	Good state
14	Beaker 40 ml	(01)	Good state



15	Erlenmeyer flask 50ml	(02)	Good state
16	Erlenmeyer flask 100 ml	(02)	Good state
17	Beaker 80ml	(04)	Good state
18	Glass To show	(08)	Good state
19	Capsule	(06)	Good state
202 1	Box of blade+lamella	(01)	Good state
22	pliers, scissors		Good state
23	Magnetic bar	(04)	Good state
24	Wash bottle 250 ml	(02)	Good state
25	Glass station	(03)	Good state
26	DBO meter with 10 positions restless	(01)	Good state
27	DCO meter	(01)	Good state
28	Turbidimeter of land+software	(01)	Good state
29	pH meter	(01)	Good state
30	Oximeter	(01)	Good state
31	Marie bath	(01)	Good state
32	Hoteplate	(02)	Good state
33	Electric cooler	(02)	Good state
34	Olympus	(01)	Good state
35	Water sampling bottle niskin 1.7 liters	(01)	Good state
36	Water sampling bottle niskin 10 liters	(01)	Good state
37	Tipper To Benthos (with sediment)	(01)	Good state
38	Device telephone	01	Good state
39	air conditioner	01	Good state
41	Disk secchi	(02)	Good state
42	Flask below empty 500 ml	(01)	Good state
43	Room of counting	(01)	Good state
44	Fillet to plankton WP2	(05)	Good state

B- Internship sites and company training:

Training place	Number of students	Duration of the internship
ARIBS Dairy (Ain Defla)	05	15 days to 03 month
Waniss Dairy (Khemis Miliana)	05	15 days to 03 month
Private Laboratory of Medical (Analyzes Dr. Zibouche Ain Defla)	05	15 days to 03 month
Bacteriology Laboratory Miliana Hospital	05	15 days to 03 month
Bacteriology Laboratory Hospital Khemis Miliana	05	15 days to 03 month
Bacteriology Laboratory Ain Defla Hospital	05	15 days to 03 month
Pastor Institute from Algiers	05	15 days to 03 month
SAIDAL (Ain-dhab Medea)	05	15 days to 03 month
DEA Laboratory (The Algerian Of the Waters)	05	15 days to 03 month
ARIBS Dairy (Ain Defla)	05	15 days to 03 month

C- Master's support research laboratories

- Laboratory Water rock plants

Chef du laboratoire : Dr. LAZALI Mohamed
N° Agrément du laboratoire : 303
Date : 03/12/2003
Avis du chef de laboratoire:
 Dr. Lazali Mohamed Enseignant - Chercheur


-Laboratory of Valuation of the natural resources

Chief of Laboratory dr. Tuafri Lasnouni

Chef du laboratoire:
N° Agrément du laboratoire : 145 du 14/04/2012
Date : 27 MARS 2016
Avis du chef de laboratoire:
 مدير المختبر د. طوافري العصنوني


D- Master's support research projects:

Entitled of project of research	Coded of project	Date of beginning of project	End date of project
Use of natural substances in the electrochemical treatment of water and in the fight against corrosion	B00L01UN440120010	01/01/2015	31/12/2018

E- Spaces of personal works:

- Library of the Faculty of Natural and Life Sciences
- University Central Library
- Department connected to the Internet network
- Faculty internet room for students.
- Educational laboratories connected to the Internet network.
- Research laboratory: Water Rock and Plant.
- Research laboratory: Valorization of Natural Resources
- Research laboratory: agricultural production and sustainable development of natural resources.
- Food Microbiology Laboratory.

II – Semester organization of teaching (semester sheets: S1, S2, S3 and S4)

1- Semester 1 :

Unit of Teaching	VHS	VH weekly				coeffi cient	Credits	Evaluation method	
	14-16 week	Course	TD	TP	Work staff*			Continued	Exam
EU fundamental									
UTF1(O/P)									
Matter 1 : Agri-food Microbiology	67:30	3:00		1h30	82:30	03	06	+	+
UTF2(O/P)									
Matter 1 : Industrial Microbiology	67:30	3:00		1h30	82:30	03	06	+	+
Matter 2 : Enzyme engineering	67:30	3:00	1h30		82:30	03	06	+	+
TU methodology									
UTM1(O/P)									
Matter 1 : Biostatistics	60:00	1h30	1h30	1h00	65:00	03	05	+	+
Matter 2 : Analytic Toxicology	45:00	1h30	1h30		55:00	03	04	+	+
TU discovery									
UTD1(O/P)									
Matter 1: Introduction to scientific research	45:00	1h30	1h30		05:00	02	02	+	+
TU transverse									
UTT1(O/P)									
Matter 1 : Entrepreneurship and management of project	10:30 p.m.	1h30			2h30	01	01	+	+
Total Semester 1	375h00	3:00 p.m.	6:00 am	4:00 am	375h00	18	30		

***= Personal work / semester2-
Semester 2 :**

Unit of Teaching	VHS	VH weekly				coeffi cient	Credits	Evaluation method	
	14-16 weeks	Course	TD	TP	Others*			Continu ed	Exam
TU fundamental									
UTF1 (O/P)									
Matter 1 : Medical microbiology	67:30	3:00		1h30	82:30	03	06	+	+
UTF2 (O/P)									
Matter 1 : Microbial ecology	67:30	3:00		1h30	82:30	03	06	+	+
Matter 2 : Genetic engineering and molecular biology	67:30	3:00	1h30		82:30	03	06	+	+
TU methodology									
UTM1 (O/P)									
Matter 1 : Validation of analytical methods in microbiology	60:00	1h30	1h30	1h00	65:00	03	05	+	+
Matter 2 : Cellular Culture	45:00	1h30		1h30	55:00	03	04		
TU discovery									
UTD1 (O/P)									
Matter 1 : Scientific English	45:00	1h30	1h30		05:00	02	02	+	+
TU transverse									
UTT1(O/P)									
Matter 1 : Legislation and regulations	10:30 p.m.	1h30			02:30	01	01	+	+
Total Semester 2	375h00	3:00 p.m.	04:30	05:30	375h00	18	30		

***= work staff/ semester**

3- Semester 3:

Unit of Teaching	VHS	VH weekly				coefficient	Credits	Evaluation method	
	14-16 week	Course	TD	TP	Others*			Continued	Exam
EU fundamental									
UTF1(O/P)									
Matter 1 : Applied microbiology and environmental	67:30	3:00		1h30	82:30	03	06	+	+
UTF2(O/P)									
Matter 1 : Microbial interaction	67:30	3:00		1h30	82:30	03	06	+	+
Matter 2 : Applied Microbiology and Analysis of microbial biodiversity	67:30	3:00		1h30	82:30	03	06	+	+
TU methodology									
UTM1(O/P)									
Matter 1: Epidemiology	60:00	3:00		1h00	65:00	03	05	+	+
Material2 : Bioinformatics	45:00	1h30		1h30	55:00	03	04	+	+
TU discovery									
UTD1 (O/P)									
Material1 : : Professional insertion and preparation to internships	45:00	1h30	1h30		05:00	02	02	+	+
TU transversal									
UTT1 (O/P)									
Matter 1: Techniques of communication	10:30 p.m.	1h30			02:30	01	01	+	+
Total Semester 3	375h00	3:00 p.m.	01:30	07:00	375h00	18	30		

***= Work staff**

4- Semester 4 :

Domain : Science of Nature And Life
Sector : Science Organic
Speciality : Applied Microbiology Master

Internship in business sanctioned by a memory and an defense.

	VHS	coeffi cient	Credits
Work Staff			
Internship in business			
Seminars			
Other (memory)	375h00		30
Total Semester 4	375h00		30

5- Summary of training: (the overall VH is separated into courses and TD, For the 04 semesters teaching, For the different types of TU)

VH	TU	TEF	UTM	UTD	UTT	Total
Course		405h00	3:30 p.m.	67:30	67:30	697h30
TD		45:00	67:30	67:30		6:00 p.m.
TP		3:30 p.m.	90:00			247h30
Work staff		742h30	360h00	3:00 p.m.	07:30	1125h00
Other (memory)		700h00				700h00
Total		2049:00	675h00	3:00 p.m.	75:00	3000h00
Credits		84	27	06	03	120
% in credits For each EU		70%	22.5%	05%	02.5%	100%

III - Detailed program by matter (1 detailed sheet by matter)

Master's title: Applied microbiology

Semester : S1

Teaching unit: Fundamental UTF1 (O/P)

Matter1 : Agri-food microbiology

Credits : 06

Coefficients : 03

Teaching objectives : Train and inform on microbiology analysis techniques, highlighting the impact of certain microorganisms on human health and the beneficial effects of certain probiotics on the intestinal flora.

Prior knowledge recommended: Food chemistry, Biochemistry, microbiology, ...

Content of the matter

1. The major microbial groups of interest to food microbiology
- Enterobacteriaceae, Pseudomonas, Acetic acid bacteria, Vibrios, Brucella, Micrococci, Streptococci, Lactobacilli, Actinobacteria, Aerobic spore-forming bacteria, Anaerobic spore-forming bacteria
2. Mushrooms
Molds and yeasts
3. Influence of manufacturing techniques on flora microbes
4. Microbiological problems in a food factory
5. Biotechnological processes
6. probiotics
7. Poisoning and toxi-infections
- Botulism, Salmonellosis, Staphylococci, Mycotoxins, Marine food poisons
8. Techniques for the control and analysis of microorganisms

Evaluation method: *Continued control, exam*

References (*Books and handouts, Site (s Internet, etc).*)

Deymie B., Multon JP. (1981). Techniques d'analyses et contrôle dans les IAA. T4, Editeur Tec et Doc, 409 p.

Bourgeois CM. et al. (1996). Microbiologie alimentaire. Tec et Doc. Londre, Paris, NY, 672p.

Adnan I., Pierson MD. (1990). Inhibition of growth and germination of C. botulinum 33 A, 40B and 1653E by essential oil of spices. J. of Food Sci., 44 (6), 1676-1678.

Botton B. et al. (1985). Moisissures utiles et nuisibles. Importance industrielle. Masson, Paris, 364 p.

Master's title: Applied microbiology

Semester : S1

Teaching unit: Fundamental UTF2 (O/P)

Matter 1: Industrial Microbiology

Credits: 06

Coefficients: 03

Teaching objectives :

This matter allow the study of:

- The operation of fermenters and the industrial practice of fermentations.
- The potential of microbial strains in terms of the biosynthesis of important metabolites (vaccines, antibiotics, enzymes, proteins, yeasts, P.O.U., cheeses, aromas, etc.)
- Optimizations and improvements of wild strains (environmental factors and conditions, mutagenesis, genetic recombination for maximum production of metabolites.

Prior knowledge recommended: General Microbiology, Food microbiology

Content of the matter :

- 1. Introduction:** The fields of activity of industrial microbiology and interest in the use of microorganisms, bacterial cell: microbial product of industrial interest
- 2. Useful Microorganisms (Archaea, bacteria, Archaea, fungi, algae and Viruses):** importance of microorganisms in industry.
- 3. Industrial culture media.**
- 4. Fermentation Technology:**
 - The fermenter, The proteins of unicellular organisms: the P.O.U. or SCP, the organisms used and the most suitable inexpensive substrates
- 5. Industrial fermentation products:**
 - 5.1. Primary metabolites obtained by microbial fermentation:**
 - Amino acids, Organic acids, Biogas (H₂, CH₄, etc.), Vaccines
 - 5.2. Secondary metabolites:**
 - Antibiotics, Vitamins (B₁₂), Polysaccharides
 - 5.3. Enzymes.**
- 6. Industrial microbiology and wastewater treatment**
- 7. Industrial microbiology of the future**

Evaluation method: *Continued control, exam*

References:

- Tortora G, Funke B et Case C: Introduction à la microbiologie, Edt du Renouveau Pédagogique INC, Québec Canada 2003
- LEVEAU Jean-Yves, BOUIX Marielle MULTON Jean-Louis . Microbiologie industrielle : Les microorganismes d'intérêt industriel(Coll. Sciences et techniques agroalimentaires) Edt ABRIA, 1993.

Master's title: Applied Microbiology
Semester : S1
Teaching unit: Fundamental UTF2 (O/P)
Matter 2: Enzyme engineering
Credits : 06
Coefficients : 03

Teaching objectives: inform about the impact and usefulness of enzymology in various fields: agri-food, pharmaceutical, agriculture,.....

Prior knowledge recommended: Notion on: fundamental enzymology, and the kinetics of chemical reactions.

Content of the matter

I-Enzymology

- Properties of enzymes
- Single-substrate enzyme kinetics
- Two-substrate enzyme kinetics
- Enzymatic inhibition
- Allosteric enzymes
- Immobilized Enzymes: Principles of immobilization methods
- Study of some applications

II- Enzymatic engineering

- Structure and purification of enzymes
- dosage of enzymatic activity
- Kinetics and order of chemical reactions
- Protein-ligand interactions
- Mechanism of catalysis
- Processes which make it possible to exploit the catalytic properties of enzymes.
- PCR detection of pathogens in food.

III- Biosensors.

IV- Modes of use of enzymes.

Evaluation method: *Continued control, exam*

References (*Books and handouts, Site (s) Internet, etc*).

- Cinétique et mécanisme d'action des enzymes.1, Cinétique enzymatique phénoménologique. Ricard, Jacques. Paris : Doin, 1973. 209 p.
- Bioorganic chemistry : a chemical approach to enzyme action. Dugas, Hermann. New York : Springer, 1996. 700 p

Master's title: Applied microbiology

Semester : 01

Teaching unit: Methodology UTM1 (O/P)

Matter: Biostatistics

Credits : 05

Coefficients : 03

Teaching objectives:

Understanding of biological and ecological facts through the analysis of numerical data.

Prior knowledge recommended:

Module of Biology, of Ecology and of Mathematics.

Content of the matter:

- Data and descriptors in ecology.
- Data and descriptors in Epidemic Biology.
- Introduction to epidemiology
- Epidemiology in the field, Goals of epidemiological practices, Tasks and methods in epidemiology, Epidemiological surveys, Expression of the results of a survey, Measurements in epidemiology, Epidemiological indicators, Interest of demography in epidemiology.
- Matrices, operations and calculations.
- Measures of association.
- Abundance distributions.
- Transformations of variables, regression and similarity models.
- Ordering and grouping.

- **Evaluation method:** Continued control, exam

References :

- DAGET., 1987. Les modèles mathématiques en écologie. Editeur : Masson. Collection: Collection d'Ecologie. 172p. ISBN-10: 2225440557.
- LEGENDRE L., 2007. Ecologie numérique t1. le traitement multiple des données écologiques. Editeur : Masson. Collection : Ecologie. ISBN-10: 2225801320.
- Bouyer J, Cordier S, Levallois P(2003). Epidémiologie, In : Environnement et sante publique, fondements et pratiques, pp. 89- 118. Gérin M, Gosselin P, Cordier S, Viau C, Quénel P, Dewailly E, rédacteurs, Edisem/ Tec & Doc, Acton Vale /Paris.

Master's title: Applied microbiology

Semester: S1

Teaching unit: Methodology UTM1 (O/P)

Matter 1: Analytic toxicology

Credits: 05

Coefficients: 03

Teaching objectives:

General presentation of the different classes of toxins, and definition of the three main aspects related to toxicology. The protocol followed (concerning the toxicological tests) to: identify and characterize the hazard.

Prior knowledge recommended: Food Chemistry, Biochemistry, microbiology, ...

Content of the matter

1. Definition
2. Classification of toxins
 - 2.1. According to the mechanism of toxic action
 - 2.2. According to their use and according to the nature of the danger
3. Aspects of toxicology
Experimental Toxicology, Analytical Toxicology and Clinical Toxicology
4. Use of the terms "ACUTE" and "CHRONIC" In experimental toxicology and In clinical toxicology
5. Toxicological tests
 - 5.1. Acute and Repeated Dose Toxicity Studies
 - 5.2. Genetic toxicity and carcinogenicity studies
 - 5.3. Reproductive function studies
 - 5.4. Maximum Residue Limit
6. Protocol followed (concerning toxicological tests)

Evaluation method : *Continued control, exam*

References (*Books And handouts, Site (s Internet, etc).*)

Carrier G, Bard D, (2003). Analyse du risque toxicologique, In : Environnement et sante publique, fondements et pratiques, pp. 203- 226. Gérin M, Gosselin P, Cordier S, Viau C, Quénel P, Dewailly E, rédacteurs, Edisem/ Tec & Doc, Acton Vale /Paris.

Philippe G., Detilleux, (2010). Toxicologie : grands principes. Ecole de l'innovation thérapeutique de l'ARIIS- Sept10.

[www.rh.inserm.fr/INSERM/IntraRH/RHPublication.nsf/0/C1DCAFF82B1600ADC12577BC00348003/\\$File/Room1.pdf?Openement](http://www.rh.inserm.fr/INSERM/IntraRH/RHPublication.nsf/0/C1DCAFF82B1600ADC12577BC00348003/$File/Room1.pdf?Openement).

Viau C, Tardif R (2003). Toxicologie, In : Environnement et santé publique, fondements et pratiques, pp. 119- 143. Gérin M, Gosselin P, Cordier S, Viau C, Quénel P, Dewailly E, rédacteurs, Edisem/ Tec & Doc, Acton Vale /Paris.

Master's title: Applied microbiology

Semester: S1

Teaching unit: Discovery UTD1 (O/P)

Matter 1: Initiation to scientist research

Credits: 02

Coefficients: 02

Teaching objectives: This teaching unit will deal with the aspects of initiation to research and development in analytical methods. It will deal with examples of published work on the separation, quantification and characterization of various samples.

Prior knowledge recommended: Mastery of 02 languages: English and French.

Content of the matter:

I- How to write a scientific document

- Internship report,

- Research paper

- Research project,

- Current research activity

II- Choice and selection of databases

III- Development of a work plan

- Cover page, summary, summary, Introduction, bibliographical part, Experimental part, conclusion.

IV- Management of bibliographical references

V- Introduction to bibliographic reference management software (End Note, etc.)

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s) Internet, Works available etc*).

- *National system of documentation in line ; SNDL*

- *Microbiologie industrielle: les micro-organismes d'intérêt industriel. Leveau, Jean-Yves, Bouix, Mireille. Paris : Tec. & Doc. 1993. 612 p.*

- *Biotechnologie. Scriban, René, Pompidou, Alain. Paris : Tec. & Doc., 1999. 1042 p.*

Master's title: Applied microbiology

Semester: S1

Teaching unit: Transversale UTT1 (O/P)

Matter 1: Entrepreneurship and project management

Credits: 01

Coefficients: 01

Prior knowledge recommended

Training Content Packages

Teaching objectives:

- Understanding of the organization and functioning of a company
- Ability to set up a business creation project
- launch and manage a project
- Ability to work methodically
- Ability to plan and meet deadlines
- The ability to work in a team
- Ability to be reactive and proactive

Content of the matter:

1. The business and business management

- Definition of a company
- Business organization
- Supply Management
- Procurement management,
- Inventory management
- Store organization
- Production management
- Production mode,
- Production policy
- Sales and Marketing Management:
- Product policy,
- Price policy,
- Advertisement,
- Technical and sales team

2- Setting up a business creation project

- Definition of a project
- Project specifications
- Project financing methods
- The different phases of project implementation
- Project management
- Deadline management
- Quality management
- Cost management
- Task management

Evaluation method: *Continued control, exam*

Master's title: Applied microbiology

Semester: 02

Teaching unit: Fundamental UTF1 (O/P)

Matter 1: Medical Microbiology

Credits: 06

Coefficients: 03

Teaching objectives:

Organized in cooperation with scientific research professors and hospital practitioners who are very involved in bio-medical and fundamental research, the Medical Microbiology module aims to train an audience mainly composed of scientific students in the current challenges of infectiology. It is in particular intended to demonstrate to what extent basic research contributes in an essential way to meeting the challenges arising from medical research, in particular in the fields concerned with bacterial, viral and parasitic and fungal infections in humans.

Prior knowledge recommended

General knowledge of general microbiology is desirable especially on the structure, physiology and genetics of microorganisms.

Content of the matter:

The major pathologies of bacterial, parasitic or viral origin: state of the question, epidemiological approaches, research challenges, current questions, prophylactic, diagnostic and therapeutic approaches

- Role of bacteria in diarrhoea, meningitis and cancer. Tuberculosis.
- Emergence of multiresistance to antibiotics: mechanisms and genetic supports
- Malaria and cerebral pathologies, antiparasitic treatments
- Acute, persistent (chronic and latent) viral infections, viruses and cancer
- Unconventional transmissible agents.
- antibiotics, classification of antibiotics, mode of action of antibiotics
- opportunistic and specific pathogenic bacteria
- mode of action of pathogenic bacteria, poisoning bacteremia sepsis, sporemia
- method of diagnosis of diseases of microbial origin, isolation, identification
- Nosocomial infections
- Antibiotic therapy

Evaluation method: Continued control, exam

References :

- site : <http://www.master.bmc.upmc.fr/> ; <http://www.edu.upmc.fr/sdv/microbiol/>
- Tortora G, Funke B et Case C: Introduction à la microbiologie, Edt du Renouveau Pédagogique INC, Québec Canada 2003.
- A.L. Defranco, R.M. Locksley, Ro. Immunité, la réponse immunitaire dans les maladies infectieuses De Boeck 2009.
- Sansonetii. Microbiologie et maladies infectieuses Editions Fayard 2009.

Master's title: Applied microbiology

Semester: 02

Teaching unit: Fundamental UTF2 (O/P)

Matter 1: Microbial Ecology

Credits: 06

Coefficients: 03

Teaching objectives:

This course is intended for microbiologists, ecologists and oceanographers wishing to acquire good knowledge of the physiology, metabolism and ecology of marine microorganisms ranging from viruses to protozoa. Studying the interactions between microorganisms will introduce students to the concept of the microbial food web. These data are essential for understanding the role played by microorganisms, particularly bacteria, in the functioning of the major cycles of matter.

Prior knowledge recommended:

Biology, microbiology, microbial metabolism, biochemistry

Content of the matter:

- The diversity and activity of microorganisms largely determine the properties of ecosystems, whether natural or artificial (anthropogenic). It is therefore necessary to be able to detect and identify them in order to be able to determine their impact in the ecosystems considered. This teaching of microbial ecology tends to illustrate microbial biodiversity, to characterize the interactions between microorganisms and to study host/microorganism interactions (symbiosis, commensalism, pathogenesis).

The course includes the following chapters:

- General notions of environmental microbiology: history of microbial ecology, microbial phylogeny and "tree of life", major types of cellular metabolism
- Techniques used to study microorganisms in situ
- Microbial consortia (biofilms), "cell-to-cell" communication, transfer of mobile genetic elements
- Soil and rhizosphere microbiology
- Microbiology of aquatic environments (freshwater, oceans)
- Microbiology of underground environments (aquifers, oil fields)
- Adaptation of microorganisms to extreme environments
- Biotransformation and biodegradation of pollutants
- Symbiotic/syntrophic relationships with eukaryotic organisms
- Biotechnology and bioprospecting

Evaluation method: *Continued control, exam*

References :

- HURST, JC, CRAWFORD RL, KNUDSEN, GR, Mc INERNEY, MJ, STETZENBACH, LD . *Manual of Environmental Microbiology*. American Society for Microbiology. Washington DC .2002.
- <http://www.master.bmc.upmc.fr/> <http://www.edu.upmc.fr/sdv/microbiol/>

Master's title: Applied microbiology

Semester: 02

Teaching unit: Fundamental UTF2 (O/P)

Matter 2: Genetic engineering and molecular biology

Credits: 06

Coefficients: 03

Teaching objectives

- Study of the strategies used in the cloning and expression of recombinant proteins of interest by the tools and methods of molecular biology and genetic engineering applications

Prior knowledge recommended

Molecular biology, microbial genetics.

Content of the matter:

Molecular biology:

1. Structure of nucleic acids, Regulation of gene synthesis, Molecular hybridizations
2. DNA Replication, DNA Alteration, Repair and Recombination
3. DNA electrophoresis on agarose gel
4. Restriction Enzymes, Vectors
6. PCR and related techniques
7. DNA chips; Marking of probes; DNA sequencing
8. Sequence alignment and homology search

Genetic engineering technique:

1. The insertion of foreign DNA into a cell
2. Obtaining DNA for Cloning
3. The selection of a clone provided with foreign genes
4. The manufacture of a gene product

The applications of genetic engineering

1. Therapeutic applications
2. Scientific applications
3. Agricultural application

genetic engineering safety and ethical issues

Evaluation method: *Continued control, exam*

References

- Biologie cellulaire et moléculaire : concepts et expériences. Karp, Gerald Wissocq, Jean-Claude. Bruxelles : De Boeck, 2004.
- Expression des gènes et génie génétique. Grppin, M. Paris : Hermann, 1987. 305 p.
- Principes de génie génétique. Primrose, Sandy Twyman Richard, Old Robert. Bruxelles : De Boeck, 2004. 400 p.

Master's title: Applied microbiology

Semester: 02

Teaching unit: Methodology UTM1 (O/P)

Matter 1: Validation of analytical methods in microbiology

Credits: 05

Coefficients: 03

Teaching objectives: The validation of methods is a recurring problem in laboratories. This subject aims to explain the objectives and fundamental principles of validation by presenting the principles of quality assurance in laboratories.

Prior knowledge recommended: Basic notion on: statistics, quality control tools, and methods and techniques of instrumental analysis.

Content of the matter

I- Statistics applied to optimization and analytical validation and sample analysis (according to ISO standards).

II- General information on experimental designs.

III- Comparison test of two samples.

IV- Measurement uncertainty.

V- Principles and vocabulary for method validation

V-1- Validation and quality control of measurement methods.

V-2- Validation by inter-laboratory study (ISO 5725 standard)

VI- Validation of microbiological and chemical methods for controlling workplaces

VII- Protocol for the validation and verification of an analytical method in: chemistry, microbiology and immunology.

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s Internet, etc).*)

Feinberg M., (2009) *Labo-Stat : Guide de validation des méthodes d'analyse* Lavoisier Tec&Doc, Paris.

Commission SFSTP, Hubert P Nguyen-Huu JJ, Boulanger B, Chapuzet E, Cohen N, Compagnon PA, Dewé W, Feinberg M, Laurentie M, Mercier N, Muzard G, Valat L, (2006) *Validation des procédures analytiques quantitatives, Harmonisation des démarches : Partie III Exemples d'application STP Pharma Pratiques* 16(2) 87-121

CENTRE D'EXPERTISE EN ANALYSE ENVIRONNEMENTALE DU QUÉBEC, *Protocole pour la validation et la vérification d'une méthode d'analyse*, DR-12-VMM, Québec, Centre d'expertise en analyse environnementale du Québec, 2012.

Master's title: Applied microbiology

Semester: 02

Teaching unit: Methodology UTM1 (O/P)

Matter 2: Culture cellular

Credits: 04

Coefficients: 03

Teaching objectives: This module allows students to learn about cell cultures and their interests in all areas.

Prior knowledge recommended: Basic notion on microbiological and biochemical sciences and on the techniques of taking samples.

Content of the matter

- Introduction
- History
- 1- Applications of cell culture
- 2- Cell culture methods
- 3- Nutrient requirements of cells in culture
- 4- Functional control of cells in culture
- 5- Storage of cell cultures
- 6- The different sterilization methods
- 7-Equipment.

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s Internet, etc).*)

--Luis Goya, M. Angeles Martín, Sonia Ramos, Raquel Mateos and Laura Bravo, « A cell culture model for the assessment of the chemopreventive potential of dietary compounds ».

Master's title: Applied microbiology

Semester: 02

Teaching unit: Discovery UTD1 (O/P)

Matter 1: Scientific English

Credits: 02

Coefficients: 02

Teaching objectives: the translation of texts from English to French, based on scientific studies published in databases such as: SNDL, Science direct, Pubmed,.....

Prior knowledge recommended: Mastery of 02 languages: English and French.

Content of the matter:

- Mastery of grammatical basics,
- Structure of sentences and arrangement of words,
- Scientific and technical vocabulary
- The detailed study of the publication
- Translation of the scientific text
- Elaboration of the texts translated into a document to be submitted to the person responsible for the subject.

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s Internet, Works And CD available etc).*)

Master's title: Applied microbiology

Semester: 02

Teaching unit: Transversal UTT1 (O/P)

Matter 1: Legislation and regulations

Credits: 01

Coefficients: 01

Teaching objectives

Introduce the learner to regulatory concepts, definitions and origins of legal texts and knowledge of criminal consequences.

Prior knowledge recommended

Training Content Packages

SKILLS aimed:

- Ability to read and understand a text of law
- Ability to apply a regulations

Content of the matter:

- General notions of law (introduction to law, criminal law).
- Presentation of Algerian legislation (www.joradp.dz, text references).
- General regulations (consumer protection law, hygiene, labeling and information, food additives, packaging, brand, harmlessness, preservation).
- Specific regulations (personal work, presentations).
- Inspection bodies (DCP, CACQUE, hygiene office, ONML).
- Standardization and accreditation (IANOR, ALGERAC).
- International standards (ISO, food codes, NA, AFNOR)

Evaluation method: *Continued control, exam*

Master's title: Applied microbiology

Semester: 03

Teaching unit: Fundamental UTF1 (O/P)

Matter 1: Applied microbiology and environmental

Credits: 06

Coefficients: 03

Teaching objectives:

Students will be introduced to the main concepts in microbial ecology and techniques for studying microorganisms in the environment ranging from the digestive tract to aquatic ecosystems and soils. They will be required to conduct an analysis from sample taking to decision making. Fermentation technology will allow the student to approach the design of a bioreactor and therefore the production of biomass and metabolites of major interest.

Prior knowledge recommended:

Microbiology, biochemistry, Environment

Content of the matter:

Environmental part: Methods for studying microorganisms. Water quality and viral ecology. Diversity of microorganisms and metabolisms. Place of microorganisms in the environment with the cycles of carbon, nitrogen and sulfur. Applied part: Culture and bacterial growth. Control of microorganisms. Bioreactor technology.

Evaluation method: Continued control, exam.

References :

- PELMONT, J. Bactéries et environnements :Adaptations physiologiques ;vol 1et 2 . Collections Grenoble Sciences (édition) OPU. 1995.
- HURST,J.C. , CRAWFORD.,R.L.,KNUDSEN ,G.R ., Mc INERNEY,M,J., STETZENBACH ,L.D. Manual of Environmental Microbiology. American Society for Microbiology. Washington DC .2002
- PRESCOT, C.M, HARLEY, J.P, KLEIN, D.A. Microbiologie De Boeck Université (2ème édition) 2003.
- Taylor, W.Advances in Microbial Ecology Kluwer Academic Publishers Group.2000
- <http://www.master.bmc.upmc.fr/> site microbiologie :
- <http://www.edu.upmc.fr/sdv/microbiol/> .<http://www.edu.upmc.fr/sdv/microbiol/>

Master's title: Applied microbiology
Semester: S3
Teaching unit: Fundamental UTF2 (O/P)
Matter 1: Microbial interaction
Credits: 06
Coefficients: 03

Teaching objectives: Examination of the role of micro-organisms in natural or artificial ecosystems.
Study of certain aspects of microbial activity in different fields

Prior knowledge recommended: Notion based on microbiological science and biochemical science .

Content of the matter

- I-Introduction
- II - Interaction between micro-organisms in a physical environment
 - 1. Ecology of microorganisms in ecosystems
 - 2- Roles of micro-organisms in the transformations of elements; biological cycles.
- III - Interaction between micro-organisms (Signals and communications, Dynamics)
- IV- Interactions between microorganisms, plants and soil
- V- Animal digestive flora and bases of pathogenicity

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s) Internet, etc*).

- Génie industriel alimentaire. Mafart, Pierre. Paris : Tec & Doc- Lavoisier : APRIA., 1991. 295 p.
- Abrégé de biochimie générale. T.1, Bioénergétique, protides, enzymologie, acides nucléiques. Percheron, François Perlès Roland, Fogletti Marie-José. Paris : Masson, 1980. 250 p.
- Phytopathologie : bases moléculaires et biologiques des pathosystèmes et fondements des stratégies de lutte. De Boeck ; Gembloux (Belgique) : les Presses agronomiques de Gembloux, 2003. 427 p.

Master's title: Applied microbiology

Semester: 03

Teaching unit: Fundamental UTF2 (O/P)

Matter 2: Applied Microbiology and Analysis of Microbial Biodiversity

Credits: 06

Coefficients: 03

Teaching objectives:

This teaching unit is the first compulsory module of the course of Applied Microbiology and Biological Engineering. It includes two modules. The first General and Applied Microbiology illustrates the diversity of microorganisms, their importance in the sectors of health, biotechnology, the food industry and biological engineering. The second module addresses the principles of conventional and innovative microbiological analysis in the analysis of the diversity of the microbial world. This training is particularly intended for students interested in employment in industry, in the sectors of industrial recovery of microorganisms, bio-remediation, waste recovery, quality control, food health quality, and management. microbiological risk

Prior knowledge recommended:

Biotechnology- microbiology - molecular biology

Content of the matter:

Job search strategies - General and Applied Microbiology Module: Protozoa, Fungi, Yeasts, Bacteria of genetic, industrial and medical interest, Viruses, Non-conventional transmissible agents, Anti-microbial treatments and microbiology risk, protection of research and industrial recovery, rights and duties of students on internships in industry, waste recovery; purifying biomasses, Biological engineering - Immunological and molecular methods for analyzing biodiversity: immunodetection techniques, library construction techniques, RFLP, SSCP, rRNA analysis techniques, biodiversity analysis, collections of microorganisms

Evaluation method: *Continued control, exam*

References :

- <http://www.master.bmc.upmc.fr/>
- <http://www.edu.upmc.fr/sdv/microbiol/>
- BULL A Microbial Diversity and Bioprospect American Society for Microbiology, 2003
- OGUNSEITAN, O Microbial Diversity: Form and Function in Prokaryotes, Wiley-Blackwell Publisher: Cashier Academic Press.2004k

Master's title: Applied Microbiology

Semester: S3

Teaching unit: Methodology UTM1 (O/P)

Matter 1: Epidemiology

Credits: 05

Coefficients: 03

Teaching objectives: Train and inform on specific examples of risk assessment (in professional and environmental settings), in order to acquire the conceptual bases and methods useful for research in toxicology and epidemiology.

Prior knowledge recommended: Notion on toxicology and on and basic knowledge in statistical analysis of data

Content of the matter

Chapter I: Risk assessment and management

Introduction, What is risk assessment?, Importance of risk assessment, Steps in risk assessment

Chapter II: Introduction to toxicology

Definition, Classification of toxic substances, Aspects of toxicology, Toxicological tests, Protocol followed (concerning toxicological tests)

Chapter III: Introduction to epidemiology

Introduction, Similarities and differences between clinical physician and epidemiologist physician, Epidemiology in the field, Goals of epidemiological practices, Tasks and methods in epidemiology, Epidemiological surveys, Expression of the results of a survey, Measurements in epidemiology, Epidemiological indicators, Interest of demography in epidemiology.

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s Internet, etc).*)

Bolduc DG, (2003). Risk management in environmental health, In Environment and health public, foundations and practices, pp. 975-994. Gerin Mr. Gosselin P, Tailpiece S, Viau C. Quenel P, Dewailly E, editors, *Edisem/ Tech & Doc*, Acton Value /Paris.

Carrier G, Bard D, (2003). Toxicological risk analysis, In: Environment and public health, foundations and practices, pp. 203-226. Gerin M, Gosselin P, Cordier S, Viau C, Quenel P, Dewailly E, editors, *Edisem/ Tech & Doc*, Acton Value /Paris.

Bouyer J, Cordier S, Levallois P(2003). Epidemiology, In: Environment and health public, foundations and practices, pp. 89- 118. Gérin M, Gosselin P, Cordier S, Viau C, Quénel P, Dewailly E, editors, *Edisem/ Tech & Doc*, Acton Value /Paris.

Master's title: Applied microbiology

Semester: S3

Teaching unit: Methodology UTM1 (O/P)

Matter 2: Bioinformatics

Credits: 04

Coefficients: 03

Teaching objectives: To highlight the importance of computer tools in the field of biology (Biochemistry, microbiology, environment, etc.), valorization of scientific research data.

Prior knowledge recommended: Notion on statistics, IT tools, good knowledge of basic IT (Word, Excel, ...).

Content of the matter

- Introduction to biosoftware (Antheprot, Biolab, etc.).
- Introduction to image processing in biology.
- Quantification and characterization of the image (example: processing on a petri dish).
- Access and consultation of bioinformatics databases (protein, DNA, RNA DATA bank, Metabolic pathway, etc.).
- Data processing software (systat, Excel and addins, sigmaplot, statistics, SPSS, GMP, etc.)
- Data simulation software (Matlab, MathCad).
- Modeling and computerization (enzyme kinetics).

Evaluation method: *Continued control, exam*

References (*Books And handouts, Site (s Internet, Works And CD available etc).*)

KRAWETZ S A., WOMBLE D. (2003) Introduction to bioinformatics: a theoretical & practical approach. Editing Tech and Doc, 728 p.

BOU RNE PE, WEISSIG H. (2003). Structural bioinformatics (Paper). Editing Tech and Doctor, 650p.

WANG Jason TL- Wu Kathy H. - WANG Paul p. (2003). Computational biology & genome informatics. Editing Tech and Doc, 268p.

- Introduction to biostatistics. Glantz, Stanton AT. Paris : McGraw-Hill, 1999. 456p.
- Biostatic: a approach intuitive. Motulsky, Harvey J. Paris : DeBoeck, 2002. 484 p.

Master's title: Applied microbiology

Semester : 03

Teaching unit: Discovery UTD1 (O/P)

Matter 1: Professional integration and internship preparation

Coefficients: 02

Credits : 02

Prior knowledge recommended:

Acquire interview techniques, law and industrial property, work psychology, accounting, business management and finance, economic analysis, internet research tools, carrying out a technical project, writing of a dissertation, defense...

Content of the matter:

- CV writing, Interview techniques, Law and industrial property, Work psychology, Accounting, Business management and finances, economic analysis, internet research tools, - Realization of a technical project, writing a dissertation , defense...

Evaluation method: Continued control, exam.

References :

Various works available.

Master's title: Applied microbiology

Semester: 03

Teaching unit: Transversal UTT1 (O/P)

Matter: Communication Techniques

Coefficients: 01

Credits: 01

Teaching objectives:

Analyze the objectives of internal and external communication and present the methodologies needed to conduct the main communication actions

Prior knowledge recommended

THE basics linguistics

SKILLS aimed:

- - Ability to communicate well orally and in writing
- Ability to present well and speak well in public
- Ability to listen and exchange
- Ability to use professional documents for internal and external communication
- Ability to write professional documents for internal and external communication

Content of the matter:

- Reinforcement of language skills
- Communication methods
- Internal and external communication
- Meeting techniques
- Oral and written communication

Evaluation method: Continued control, exam

