DEMOCRATIC PEOPLE'S REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

HARMONIZATION

MASTER TRAINING OFFER

ACADEMIQUE

Etablissement	Faculty	Departement
Hassiba Ben Bouali Chlef University	Faculty of Sciences	Biology

Field : Natural and life sciences

Branch : Biological Sciences

Speciality : Applied biochemistry

Context and objectives of training

A- Program overview

The master's degree in applied biochemistry offers a multidisciplinary and highly qualified teaching at the forefront of current research in life sciences through several areas of competence such as analytical biochemistry, metabolic biochemistry and physiology, biochemical engineering, genomics, proteomics and metabolomics, bioinformatics and biotechnologies by supplementing the theoretical knowledge of fundamental biochemistry acquired in Bachelor's degree with knowledge in the fields of bio-engineering and bio-biotechnologyanalysis to create new opportunities for living and exploit them on a large scale.

This course proposes to develop the methodology and experimental rigor essential for research and development work as well as analytical tools in the field of biochemistry. Provides cutting-edge knowledge in cellular energy production, biomolecules and enzymology by understanding the biochemical mechanisms in place.

The training allows to integrate data at the molecular level in order to find daily applications and understand the different cellular mechanisms.

The link between theory and practice is made through practical internships in biochemical laboratories and bio-industries.

B- Highlights of the program

The graduate of MASTER mention Biology, specialty Applied Biochemistry can claim to diversified fields in which will be implemented the following activities :
- Knowledge transmission, dissemination of knowledge, communication and scientific animation, teaching
- Basic or applied research, laboratory or field experiments (medical analyses, bio-industries....)
- Data collection and management

The region has enormous potential for the professional integration of diplomas into the proposed course, namely :
- Public hospitals
- Private clinics
- Quality control centres
- University laboratories

At the national level :
- Research centres
- Institut pasteur
- Pharmaceutical laboratories

All other courses related to biology, including biochemistry.

C- Information about admissions

Any student with a LMD degree in the following specialties :
- Biochemistry
- Microbiology
- Microbial biotechnology

D- Basic Course

The basic courses, organized in four semesters spread over two academic years, are part of a multidisciplinary approach linked to other specialties, such as microbiology, genetics and molecular biology. Some examples of topics covered in the core courses include :
1. Bioenergetics : The study of the transformations of the energy brought by the external environment to the cell, and this in a way usable for it. This theme is important for understanding the biochemical reactions of energy metabolism.
2. Chemical engineering : This course is designed to provide the student with the necessary knowledge of solution chemistry and chemical engineering unit operations including chemical analysis and separation methods.
3. Proteomics : The objective of this teaching is to enable the student to learn the techniques of studying all proteins present in the body.
4. The instrumental methods of analysis : The objective of teaching is to train the student in analytical techniques and devices used in laboratories for analysis, control and research.
5. Biochemistry and microbial physiology : Describe the information of bacterial physiology and metabolic pathways of degradation and biosynthesis.
6. Genomics and Bioinformatics : This course introduces the student to techniques and methods of structural and functional analysis of the genome of living organisms.
7. Immunohematology : Have necessary theoretical knowledge on hematology, and experimental immunology.
8. Pharmacotoxicology : Have the theoretical knowledge necessary to implement experimental pharmacology.
Know how to implement experimental protocols for the study:
- Of the drug-receptor interaction
- Pharmacological activity for the broad therapeutic classes

E- Advanced topics

Advanced subjects deepen the concepts and techniques presented in the basic courses and introduce more specialized areas. They are generally intended for students who already have a solid foundation in Toxicology and Chemistry. Here are some examples of advanced subjects :
1. Biochemical Engineering
2.Analytical and quantitative biochemistry
3. Biochemistry and nutritional physiology in humans
4. The culture of cells
5. The synthesis of biomolecules
6. Studies of experiments on animals

Semi-annual organizational sheet of lessons

(Please submit 4-semester worksheets)

1- Semester 1 :

Teaching unit	Half-yearly hourly volume	Weekly hourly volume				Coeff	Credits	Evaluation mode	
	14-16 weeks	Courses	Tutorial	Pratical work	Others			Continuous	Examination
Fundamental units									
UEF1(O/P)									
Subject 1: Bioenergetics	67h30	3h	1h30	-	82h30	3	6	02	01
Subject 2: Chemical Engineering	67h30	1h30	1h30	1h30	82h30	3	6	02	01
UEF2(O/P)									
Subject 1: Proteomics	67h30	3h	1h30		82h30	3	6	02	01
Methodologic units									
UEM1(O/P)									
Subject 1: Genomics and Bioinformatics	60h	1h30	1h30	1h	65h	3	5	01	01
Subject 2: Biostatistics	45h	1h30	1h30	-	55h	2	4		
Discovery units									
UED1(O/P)									
Subject 1: Good laboratory practice and quality	45h	1h30	-	1h30	5h	2	2	01	01
Transversal units									
UET1(O/P)									
Subject 1: Communication	22h30	1h30	-	-	2h30	1	1	01	01
Total Semester 1	**375**	**13h30**	**7h30**	**4h**	**375h**	**17**	**30**	12	08

2- Semester 2 :

Teaching unit	Half-yearly hourly volume	Weekly hourly volume				Coeff	Credits 14-16 weeks	Evaluation mode	
	14-16 weeks	Courses	Tutorial	Pratical work	Others			Courses	Tutorial
Fundamental units									
UEF1(O/P)									
Subject 1 : Human physiological and nutritional biochemistry	67h30	3h	1h30		82h30	3	6	02	01
Subject 2 : Biochemistry and physiology of microorganisms	67h30	3h		1h30	82h30	3	6	02	01
UEF2(O/P)									
Matière 1 : Biochemical engineering	67h30	1h30	1h30	1h30	82h30	3	6	02	01
Methodologic units									
UEM1(O/P)									
Subject 1 : Instrumental methods of analysis	60h	1h30	1h30	1h	65h	3	5	01	01
Subject 2 : Cell cultures	45h	1h30	-	1h30	55h	2	4		
Discovery units									
UED1(O/P)									
Subject 1 : scientific English	22h30	1h30	1h30	-	5	2	2	01	01
Transversal units									
UET1(O/P)									
Subject 1 : Legislation	22h30	1h30	-	-	2h30	1	1	01	01
Total Semester 2	**375h**	**13h30**	**6h**	**5h30**	**375h**	**17**	**30**	12	08

3- Semester 3 :

Teaching unit	Half-yearly hourly volume	Weekly hourly volume				Coeff	Credits 14-16 weeks 14-16 weeks	Evaluation mode	
	14-16 weeks	Courses	Tutorial	Pratical work	Others			Courses	Tutorial
Fundamental units									
UEF1(O/P)									
Subject 1 : Immunohematology	67h30	3h	-	1h30	82h30	3	6	02	01
Subject 2 : Pharmacology-toxicology	67h30	3h	1h30		82h30	3	6	02	01
UEF2(O/P)									
Subject 1 : Synthesis of biomolecules	67h30	1h30	1h30	1h30	82h30	3	6	02	01
Methodologic units									
UEM1(O/P)									
Subject 1 : Quantitative analytical biochemistry	60h	1h30	1h30	1h	65h	3	5	01	01
Subject 2 : Microbial control techniques	45h	1h30	1h30	-	55h	2	4		
Discovery units									
UED1(O/P)									
Subject 1 : Animal experimentation	45h	1h30	-	1h30	5	2	2	01	01
Transversal units									
UET1(O/P)									
Subject 1 : Entrepreneurship	22h30	1h30	-	-	2h30	1	1	01	01
Total Semester 3	**375h**	**13h30**	**6h**	**5h30**	**375h**	**17**	**30**		07

4- Semester 4 :

Field : Science of nature and life
Branch : Biological Sciences
Specialty : Applied Biochemistry

Internship in a company, followed by a Master thesis and a defence.

	Half-yearly hourly volume	Coeff	Credits
Personal work	225h	9	18
Internship	150h	6	12
Seminars	-	-	-
Others	-	-	-
Total Semester 4	375h	15	30