

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

**MINISTRY OF HIGHER EDUCATION
AND SCIENTIFIC RESEARCH**

ENGINEERING EDUCATION OFFER

**HIGHER SCHOOL OF BIOLOGICAL SCIENCES OF
ORAN**

Field: NATURAL AND LIFE SCIENCES

Section: BIOTECHNOLOGY

Speciality: MOLECULAR BIOLOGY

Sommaire

I- Fiche d'identité de l'ingéniorat.....	1
1 - Localisation de la formation	2
2 - Localisation de la formation	2
3 - Contexte et objectifs de la formation	2
A - Conditions d'accès	2
B - Objectifs de la formation	2
C - Profils et compétences visées	2
D - Potentialités régionales et nationales d'employabilité	3
E - Passerelles vers les autres spécialités	3
F - Indicateurs de suivi de la formation.....	3
G – Capacités d'encadrement.....	4
4 - Moyens humains disponibles.....	4
A - Enseignants intervenant dans la spécialité	4
B - Encadrement Externe.....	6
C - Laboratoires de recherche de soutien à l'ingéniorat	7
D - Projets de recherche de soutien à l'ingéniorat	7
E - Espaces de travaux personnels et TIC	7
II- Fiche d'organisation semestrielle des enseignements	08
1- Semestre 1	09
2- Semestre 2	10
3- Semestre 3	11
4- Semestre 4	12
5- Semestre 5	13
5- Semestre 6	14
III- Programme détaillé par matière.....	22

I– **Training** identity card

Section: BIOTECHNOLOGY

Speciality: MOLECULAR BIOLOGY

1. Location of the training:

HIGHER SCHOOL IN BIOLOGICAL SCIENCES OF ORAN

2. Partners:

- University of Science and Technology of Oran – Mohamed Boudiaf
- University Oran 1 Ahmed Ben Bella
- National School of Biotechnology - Constantine
- Higher School of Agronomy - Mostaganem

1. Context and objectives

A. Conditions of access

- 1st year: On average of the baccalaureate defined each year by the ministry of higher education And scientific research.
- 3rd year: By national competition for access to higher schools.

B. Objectifs de la formation

The 2nd cycle training in Molecular Biology aims to train students able to easily manipulate biological molecules. Essentially based on the knowledge of proteins, nucleic acids and molecules of the secondary metabolism, this training will first give the most recent theoretical tools, in particular of molecular biology and genomics, then practices of extraction, purification, transformation, production and analysis of these molecules for research, development and above all production purposes.

Currently, all life sciences use the molecular and biochemical tool. By mastering these tools, students trained during this second cycle can be called upon in all areas of biology. But more specifically, they will be called upon to design their own work and production tool in the new cutting-edge biology professions.

C. Targeted Profiles and skills :

At the end of this training, graduates of the Molecular Biology specialty of the Higher School of Biological Sciences of Oran will be equipped with a high level theoretical and practical education. Students will have acquired the following skills:

- Scientific and technical knowledge in genetics, molecular biology, genetic engineering, genomics and bioinformatics. Students will develop the necessary skills for the manipulation and transformation of biological molecules for the purpose of producing metabolites of interest with high added value, as well as the development of molecular diagnostic methods for microbiological, animal or plant use, or molecular identification of pathogens, GMOs, and this, in particular by producing biological kits in general and molecular biology kits in particular for didactic use, diagnosis and/or research.

-

- Scientific and technical knowledge in biochemistry, microbiology, immunology, enzymology and protein engineering. Students will develop the necessary skills to produce, purify and characterize molecules of biotechnological interest.
- Ability to work on various issues affecting key sectors (environment, industry, bioenergy, etc.) and ability to lead projects in order to propose solutions for these various issues.
- Thanks to entrepreneurship workshops, as well as various teachings such as bioengineering workshop, intellectual property law, biosafety and bioethics and professional integration internships, students will have the necessary skills for business creation.
- Ability to work on a research project, as well as the writing of scientific documents (manuscripts and scientific articles) and to communicate the results (in French and in English).

D. Regional and national employability potential of graduates

This engineering training in molecular biology offered by ESSBO is first of all a high-level practical training, the student can easily integrate the medical analysis and/or quality control laboratories. This will make it possible to compensate for the lack of mastery of molecular biology tools in the various quality control, analysis and diagnosis structures in the country. This education is also an academic training aimed at producing researchers for the various research centers and for doctoral training programs.

Still in the applied field, the trained student can integrate any biotechnology company producing biological material. Steps in this direction are underway with some Algerian companies. On the other hand, the training encourages above all the creation of companies and Startups.

It is also an academic training aimed at training future researchers for the various research centers and for doctoral training, the student could also easily integrate the research centers for diagnostic assistance, biotechnology, green chemistry, proteomics and other research centers or laboratories handling proteins and nucleic acids.

E. Methods of educational evaluation of students

The assessment of students' knowledge during their educational progress is governed by the regulation texts. A minimum eliminatory mark set at 06/20 has been established for any subject making up the course.

F. Bridges to other specialties

Students admitted in the 3rd year and not having the average required to continue the 1st year of the second cycle of the school can directly integrate the Natural and Life Sciences university bachelor's trainings. The common core being similar.

G. Training monitoring indicators

The follow-up of a training course results is the follow-up of ratio-type indicators comparing the "forecast" and the "realized" in terms of the rate of completion of a task, the productivity of human resources (teachers), consumption of budget and finally of the employability of the product of the training. An indicator is an information which will help the carrier of the training to measure a situation and to take a decision consequently. The decision may be to continue in the same direction or, on the contrary, to adopt corrective measures.

Task completion rate (TCR)

With this indicator we measure whether a task lasted or should last longer or shorter than what was initially planned.

$$\text{TCR} = (\text{Actual Duration} - \text{Initial Duration}) / \text{Initial Duration}$$

This indicator can be applied to the duration of a subject, to the duration of a teaching unit or to the duration of a semester of the year or to all the years.

Human Resource Productivity (HRP)

This is an indicator for measuring the productivity of members of the training team. In real time, we measure the number of hours spent with regard to the percentage of completion of the task.

$$\text{PRH} = \text{number of hours actually spent} * \text{TCR}$$

And we compare this ratio to the number of hours planned to achieve this same % of completion of the task. This will make it possible to evaluate either a delay or an advance on the schedule or compliance with the schedule.

Similarly, other indicators can be monitored. Thanks to these indicators, we can quickly assess any deviations from the objective and communicate effectively and quickly with all training stakeholders.

C. Supervisory capacity:

Given the objectives of excellence and the very high-level training mission, the maximum number of students to be supported by specialty cannot exceed 20 Students.

H. Available human resources

A. Teachers of the school interfering in the speciality

Last name	First name	Speciality	Grade	Type of intervention
Saidi	Djamel	Physiologie	Pr.	Course/tutorial/practical work.
Tbahriti	Hadja Fatima	Nutrition Clinique et Métabolique	MCA	Course/tutorial/practical work

Gabed	Noujoud	Biologie moléculaire	MCA	Course/tutorial/practical work
Felidj	Menel	Ecologie Végétale	MCA	Course/tutorial/practical work
Boughrara	Wefa	Biologie moléculaire et Génétique	MCA	Course/tutorial/practical work
Marzoug	Mohamed	Ecosystèmes microbiens complexes	MCA	Course/tutorial/practical work
Mahammi	Fatima Zohra	Biologie moléculaire et Génétique	MCA	Course/tutorial/practical work
Boukhari Benahmed Daidj	Nabila	Nutrition Intérêts et risques sur la santé	MCA	Course/tutorial/practical work
Kechar	Kheira	Biodiversité Végétale et Valorisation	MCA	Course/tutorial/practical work
Rahli	Fouzia	Microbiologie appliquée	MCA	Course/tutorial/practical work
Khelil	Omar	Biotechnologie Végétale	MCA	Course/tutorial/practical work
Choubane	Slimane	Biotechnologie	MCA	Course/tutorial/practical work
Mahdjour	Soumicha	Productions Végétales et Microbiennes	MCA	Course/tutorial/practical work
Chekroun	Chahinez	Physiologie Végétale	MCB	Course/tutorial/practical work
El-Kebir	Aslya	Chimie des Polymères	MCB	Course/tutorial/practical work
Fodil	Mostefa	Biologie moléculaire	MCB	Course/tutorial/practical work
Medjdoub	Lahouaria	Chimie des Polymères	MCB	Course/tutorial/practical work
Bouderbala	Hadjer Soumia	Physiologie Animale	MCB	Course/tutorial/practical work
Boukadoum	Ali	Nutrition Clinique et Métabolique	MCB	Course/tutorial/practical work
Haddi	Abir	Physiologie Animale	MCB	Course/tutorial/practical work
Guendouz	Malika	Physiologie Animale	MCB	Course/tutorial/practical work
Redouane	Dalal	Physiologie Animale de la Nutrition et Sécurité alimentaire	MCB	Course/tutorial/practical work

Benayad	Sarah	Chimie organique minérale et industrielle	MCB	Course/tutorial/practical work
Benyettou	Imene	Biochimie Appliquée -Bio toxicologie	MCB	Course/tutorial/practical work
Ilias	Wassila	Immunologie	MCB	Course/tutorial/practical work
Boughoufala	Mohamed	Les systèmes photovoltaïques	MCB	Course/tutorial/practical work
Yakoubi	Fatima	Physiologie Végétale	MAA	Course/tutorial/practical work
Dehiba	Faiza	Nutrition Clinique et Métabolique	MAA	Course/tutorial/practical work
Belbouri	Khadra	Traitement des Surfaces et Science des Matériaux	MAA	Course/tutorial/practical work
Henni	Ibrahim	Informatique	MAA	Course/tutorial/practical work
Lahcene	Batoul Sofya	Civilisation Américaine	MAA	Course/tutorial/practical work
Mahmoudi	Bahia	Nutrition Clinique et Métabolique	MAA	Course/tutorial/practical work
Mimoun	Asmaa	Biologie Végétale	MAA	Course/tutorial/practical work
Nasser	Soraya	INFORMATIQUE	MAA	Course/tutorial/practical work
Seddikioui	Leila	Production Animale et Contrôle de Qualité	MAA	Course/tutorial/practical work

B. External supervision:

Attached institution: UNIVERSITY ORAN 1- USTO

Name, First name	Grade	Research laboratory	Type of intervention
Abiayad S.M.E.A.	Pr	Aquabior	Course/ practical work/ supervision
Ali Mehidi S.	Pr	Aquabior	Course/ practical work/ supervision
Hamaizi H.	Pr		Course
Lamara S-A.C.	Pr	Aquabior	Course/ practical work/ supervision
Kadhum E.A.	Pr		Course
Benbayeur Z.	Pr		Course/ practical work/ supervision
Fatmi L.	MA	Aquabior	tutorial/practical work
Benyamina M.	MA	Aquabior	tutorial/practical work
Lechehab S	MA	Aquabior	tutorial/practical work
Bekada I.	MCA	Aquabior	tutorial/practical work
Ameziane E.-H.	MA	Aquabior	tutorial/practical work
Attab K.	MA	Aquabior	tutorial/practical work
Amrani E.	MCA	Biologie moléculaire	tutorial/practical work
Dergal N.	MCB	Aquabior	Course
Aoues Aek	Pr	Toxicologie	Course
Zemani Fodil Faouzia	Pr	Biologie moléculaire	Course

C. Support Research Laboratories: AQUABIOR

Head of laboratory ABIAYAD SIDI MOHAMED EL AMINE
N° Approval of laboratory
<p>Date : approved in 2011 code 071</p> <p>Head of laboratoty notice : Favorable</p>

D. Support research projects :

Title	Code	Start	End
PROJET CEE	2016_00892 - - Projet H2020 MSCA-RISE 2016	2016	2020

E. Personal work spaces and TIC:

Library of the Higher School of Biological Sciences of Oran

Semester organization card of teachings

6 semesters (1st, 2nd and 3rd year)

1. SEMESTER 1

Teaching unit TU	Weeks	Number of hours/week				Coefficient	Credits	Evaluation mode	
	14-16	Courses	Tutorials	Practical work	Other*volume hours			Continuuous	Exam
Fundamental TU						9	18	40%	60%
FTU 1 (O/P)									
Molecular biology 1	45h00	01h30	01h30	-	70h00	3	5	X	X
Microbiological engineering	45h00	1h30	1h30	-	55h	2	4	X	X
FTU2 (O/P)									
Techniques and methods of molecular biology	45h00	1h30	1h30	-	55h	2	4	X	X
Fundamental enzymology	45h00	1h30	1h30	-	55h	2	4	X	X
Methodology TU						5	9		
MTU1 (O/P)									
Workshop of molecular biology (01): Methods of molecular biology	60h00	-	-	4h00	60h00	3	5	X	X
MTU2 (O/P)									
Workshop of microbiological engineering	45h00	-	-	3h00	55h00	2	4	X	X-
Discovery TU						2	3		
Introduction to biotechnology	45h00	01h30	01h30		25h00	1	2	X	X
documentary research and scientific writing	22h30	01h30			15h00	1	1	X	X
Transversal TU						1	1		
English for Biologists - Starter	22h30	1h30	-	-	2h30	1	1	X	X
Total Semester 1	375h	157h30	112h30	105h00	375h	17	30		

2. SEMESTER 2

Teaching unit TU	Week s	Number of hours/week				Coeff	Credits	Evaluation mode	
	14-16	Cours e	Tutori al	Practic al work	Other*volu me hours			Continuo us	Exam
Fundamental TU						9	17	60%	40%
FTU1(O/P)									
Molecular biology 2	45h0 0	01h30	01h30	-	70h00	3	5	X	X
Molecular genetics of microorganis ms	45h0 0	01h30	01h30	-	50h00	2	4	X	X
FTU2 (O/P)									
Cellular biology <i>in vitro</i> and <i>in vivo</i>	45h0 0	01h30	-	01h30	50h00	2	4	X	X
Protein engineering	45h0 0	01h30	01h30	-	50h00	2	4	X	X
Methodology TU						5	9		
MTU1 (O/P)									
Workshop of Molecular biology 2: application on a microbial model	60h0 0	-	-	04h00	60h00	3	5	X	X
MTU2 (O/P)									
Workshop of biochemistry	45h0 0	-	-	03h00	50h00	2	4	X	X
Discovery TU						2	3		
Plant biochemistry	45h0 0	01h30	-	01h30	25h00	1	2	X	X
Scientific communicatio n	22h3 0	01h30	-	-	15h00	1	1	X	X
Transversal TU						1	1		
English for Biologists - Elementary	22h3 0	01h30	-	-	05h00	22h3 0	01h30	X	X
Total Semester 2	375h	157h3 0	90h0 0	127h3 0	375h	375h	157h3 0	90h00	127h3 0

3. SEMESTER 3

Teaching unit TU	Week s	Number of hours/week				Coe ff	Credit s	Evaluation mode	
	14-16	Cours e	Tutori al	Practic al work	Other*volu me hours			Continuo us	Exa m
Fundamental TU						9	17	60%	40%
FTU1 (O/P)									
Molecular genetics of eucaryots	45h0 0	01h30	01h30	-	70h00	3	5	X	X
Bioinformatics	45h0 0	-	-	03h00	50h00	2	4	X	X
FTU2 (O/P)									
Cellular and molecular signalisation	45h0 0	01h30	01h30	-	50h00	2	4	X	X
Enzyme engineering	45h0 0	01h30	01h30	-	50h00	2	4	X	X
Methodology TU						5	9		
MTU1 (O/P)									
Workshop of molecular biology (03) : Application on an eucaryotic model	60h0 0	-	-	04h00	60h00	3	5	X	X
MTU2 (O/P)									
Workshop of enzyme engineering	45h0 0	-	-	03h00	50h00	2	4	X	X
Discovery TU						2	2		
Bioprogrammat ion	45h0 0	-	-	03h00	25h00	1	2	X	X
Droits de Propriété Intellectuelle	22h3 0	01h30	-	-	15h00	1	1	X	X
Transversal TU						1	1		
English for Biologists – Pre- intermediate	22h3 0	01h30	-	-	5h00	1	1	X	X
Total Semester 3	375h	157h3 0	67h30	195h0 0	375h	17	30		

4. SEMESTER 4

Teaching unit TU	Weeks	Number of hours/week				Coeff	Credits	Evaluation mode	
	14-16	Course	Tutorial	Practical work	Other*volume hours			Continuous	Exam
Fundamental TU						9	17	40 %	60 %
FTU1 (O/P)									
Genomics and proteomics	45h00	01h30	01h30	-	70h00	3	5	X	X
Genetic engineering	45h00	01h30	01h30	-	50h00	2	4	X	X
FTU2 (O/P)									
Pharmacogenetics and Personalized Therapy	45h00	01h30	01h30	-	50h00	2	4	X	X
Immunogenetics and Biotherapy	45h00	01h30	01h30	-	50h00	2	4	X	X
Methodology TU						5	9		
MTU1 (O/P)									
Workshop of molecular biology (04) : Genetic engineering	60h00	-	-	04h00	60h00	3	5	X	X
MTU2(O/P)									
Workshop of electronics : Application to biotechnologies	45h00	-	-	03h00	50h00	2	4	X	X
Discovery TU						2	3		
Entrepreneurship and Project Management	45h00	01h30	01h30	-	25h00	1	2	X	X
Nanobiotechnologies	22h30	01h30	-	-	15h00	1	1	X	X
Transversal TU						1	1		
English for Biologists – Intermediate	22h30	01h30	-	-	05h00	1	1	X	X
Total Semester 4	375h	157h30	112h30	105h00	375h	17	30		

5. SEMESTRE 5

Teaching unit TU	Week s	Number of hours/week				Coef f	Credit s	Evaluation mode	
	14-16	Cours e	Tutori al	Practic al work	Other*volu me hours			Continuo us	Exa m
Fundamental TU						9	17	40 %	60 %
FTU1 (O/P)									
Métagenomi cs	45h0 0	01h30	01h30	-	70h00	3	5	X	X
Synthetic Biology	45h0 0	01h30	01h30	-	50h00	2	4	X	X
FTU2 (O/P)									
Plant Biotechnolog y and Plant Breeding	45h0 0	01h30	-	01h30	50h00	2	4	X	X
Bioprocess Design: Case Studies	45h0 0	01h30	01h30	-	50h00	2	4	X	X
Methodology TU						5	9		
MTU1 (O/P)									
Workshop of molecular biology (05) : Gene and Protein Expression	60h0 0	-	-	04h00	60h00	3	5	X	X
MTU2 (O/P)									
Worshop de Bioengineeri ng	45h0 0	-	-	03h00	50h00	2	4	X	X
Discovery TU						2	3		
Biostatistics	45h0 0	01h30	01h30	-	25h00	1	2	X	X
Biosafety and Bioethics	22h3 0	01h30	-	-	15h00	1	1	X	X
Transversal TU						1	1		
English for Biologists – Advanced	22h3 0	01h30	-	-	5h00	1	1	X	X
Total Semester 5	375h	157h3 0	90h00	127h30	375h	17	30		

6. SEMESTRE 6

Teaching unit	Week s	Number of hours/week				Coef f	Credit s	Evaluation mode	
------------------	-----------	----------------------	--	--	--	-----------	-------------	-----------------	--

		Seminar	Internship	Personal work	other			Continuou s	Exam thesis defens e
Fundament al TU									
FTU 1 (O/P)									
Matière 1 : Projet de fin d'études	750	75	225	450	-	17	30	50 %	50 %
Total Semester 6	750	75	225	450	-	17	30		