Benha University
Faculty of Science
Department of Zoology

Biotechnology B.Sc. Program Specification

A. Basic Information

Program Title: Biotechnology B.Sc. Program
Program Type: Major
Department: Zoology Departement.
Coordinator: Dr. Marwa Atef Elewa
Internal Evaluator: Dr. Doaa Sabry Ibrahim
External Evaluator: Prof. Dr. Abdel Aziz Diab
Date of the most recent approval of program specification by the faculty council: 9/12/2015 No. (390)

B. Professional Information

1. Program Aims

The overall aims of the program are to provide the graduate with:

a) Learn advanced subjects related to different branches of biotechnology.
b) Recognize the basic sciences essential for life basic processes at the level of cell, organism and ecosystems.
c) Apply gained knowledge, concepts, experience and theories from biotechnology in practical manner and laboratory techniques.
d) Develop the skills and attitude necessary for independent learning and participate effectively in research activities or different areas of work.
e) Investigate the relationship and interactions among different disciplines in biotechnology and the environment.
f) Recognize the legislations and ethics related to the environment preservation and human health.
g) Employ scientific facts and theories to analyze and interpret data of different method.
h) Plan the experimental work using instruments, safety regulation and quality control processes, assess and manage risks on practical manner.
i) Point out the modern subjects of general biology and biotechniques.
j) Participate effectively as a member in teamwork recognize and respect the views and opinions of the others, respect for animal and plant life, as well as exhibiting the sense of beauty and neat-ness.
k) Learn risk assessment, health and safety regulations and respect for animal and plant life.

2. Intended Learning Outcomes (ILO's)

2.1 Knowledge and Understanding

By the end of the program, the graduate will be able to:

a.1 Select theories, concepts and techniques related to biotechnology, write reports on the data in accordance with the standard scientific guidelines and select theories from Biostatistics to describe data in a significant manner.
a.2 Recognize the different physiological and immunological process in animals.
a.3 Characterize the structure of various types of animal tissues and organs.
a.4 Describe the biological molecules and its role in cellular activities.
a.5 Describe the immunological system and its mechanism of action.
a.6 Recognize different ecological systems, pollution and the effect of pollution on biological systems.
a.7 Recognize theories, facts, concepts, fundamentals and techniques related to genetics.
a.8 Know cell organelles, division, mechanism of death, blood component and functions and all physiological process in cells.
a.9 Describe gametes, fertilization, embryonic stages and development of growth in some animals.
a.10 Recognize the classification, morphology, structural and functional anatomy and the life cycle of organisms and List animals and some plants according to their classification.
a.11 Know the toxic animals and their effects on the environment and human health and know types of radiation and its application.
a.12 Understand the structure and function of various types of animal cells in unicellular and multicellular organisms and study biodiversity.
a.13 Recognize biochemistry, mechanism of organic reactions and characterize the principles, procedures and techniques used in biological and chemical analysis.
a.14 Recognize the principles of molecular biology and histopathological techniques.
a.15 Recognize the principles of biophysics and its applications.
a.16 Understand the essential facts, major concepts, principles, and theories in basic sciences (entomology, physics, geology, botany, mathematics, and statistics) and other sciences to understand the recent advances in biotechnology.

2.2 Intellectual Skills

By the end of the program, the graduate will be able to:

b.1 Analyze problems effectively in all disciplines of biology.
b.2 Interpret a piece of information in the light of evidence provided by biotechnology.
b.3 Interpret information to confirm and make evidence related to recent progresses in biological research.
b.4 Deduce mechanisms and procedures to deal with scientific problems relevant to advanced approaches in biotechnology.
b.5 Link knowledge gained from different sources and cell signaling mechanisms in

regulating cellular functions.

b.6 Plan a research task to solve problems.

b.7 Interpret quantitative data in graphs, figures, table and other sources of information.

b.8 Apply the investigations in a responsible, safe and ethical manner, paying attention to risk assessment and safety regulation.

2.3 Skills

2.3.1 Professional and Practical Skills

By the end of the program, the graduate will be able to:

c.1 Analyze the data using appropriate techniques in the laboratory in accordance with the standard scientific guide and solve problems by a variety of methods.

c.2 Use the laboratory equipment, instruments and tools efficiently in safe and ethical manner to investigate living systems.

c.3 Distinguish different types of organisms, cells and tissues and compare between different stages of development in different animals.

c.4 Select statistical methods and computational tools to analyze and interpret experimental data in terms of theories relevant to biotechnology.

c.5 Select the essential facts, major concepts, principles, and theories in basic sciences (chemistry, physics, geology, botany, entomology, mathematics, and statistics).

c.6 Categories techniques in immunology and molecular biology to serve the field of biotechnology.

c.7 Select animal, marine environmental samples to dissect them and prepare microscopic section.

c.8 Examine biological samples from tissues and blood to investigate abnormalities.

c.9 Describe various biological and chemical samples and differentiate the physical and chemical properties of compounds.

c.10 Analysis various biological and chemical samples and identify them.

2.3.2 General Skills

By the end of the program, the graduate will be able to:

d.1 Use communication technology to communicate with the organization on the worldwide stage for discussion of data, acquiring advice, exchange of experiences and solve problems on a scientific basis..

d.2 Collaborate effectively with teamwork members to maintain independent and critical thinking, effective time-management and positive communication and cooperation with other members of the team work.

d.3 Effectively manage tasks, time, and resources and set clear guidelines and performance indicators.

d.4 Search for information and engage in lifelong self learning discipline.
d.5 Solve the community linked problems with attention to the community ethics and traditions.
d.6 Play role in in public awareness using scientific knowledge system, modules and tools.
d.7 Develop the skills effectively in research activities.
d.8 Modify sense of beauty and neatness

3- Academic standards of the program

The academic standards of the program are designed and adapted to satisfy the criteria presented in academic reference standards (ARS) produced by the department of zoology council committee. It is approved by the faculty council committee 13/5/2015. Currently it is in the process of approval by the national authority for quality assurance and accreditation for education.

4- Reference indices (Benchmarks)
Not utilized.

5- Curriculum structure and contents of program
a- Program duration: four levels (8 semesters)
b- Program structure:

Program	Credit hours
Compulsory	116
Optional	20
Elective	4
Total	140

Program	Credit hours	Percentage
Basic sciences	33	23.57 %
Humanities (including language)	5	3.57 %
Specialized courses	97	69.29%
Computer and IT	5	3.57%
Total	140	100 %

d- Program Courses:
Symbols in the list and their meanings

Connotation	Symbol
University requirement	Ur
Faculty requirement	Fr
Botany	B
Chemistry	Ch
Entomology	E
Geology	G
Mathematics	M
Mathematical Statistics	MS
Physics	Ph
Zoology	Z

A- **University requirement courses**:

The student studies (8 credit hours) in first level

Code No.	Course Title	No. of Units	No. of hours/week			level
			Lect.	Exer.	Prac.	
015 Ur	English (1)	2	2	-	-	first
030 Ur	Computer Science (1)	3	2	-	2	first
040 Ur	Computer Science (2)	2	1	-	2	first
050 Ur	Human Rights	1	1	-	-	first

B- Faculty requirement courses:

B.1- Compulsory courses:

The student studies (18 hours) in first level

Code No.	Course Title	No. of Units	No. of hours/Week			Level
			Lect.	Exer.	Prac.	
100 M	General Mathematics (1)	3	2	2	-	first
105 M	General Mathematics (2)	3	2	2	-	first
100 Ph	General Physics (1)	2	2	-	-	first
105 Ph	General Physics (2)	2	2	-	-	first
181 Ph	Practical Physics (1)	1	-	-	3	first
180 Ph	Practical Physics (2)	1	-	-	3	first

100 Ch	General Chemistry (1)	2	2	-	-	first
105 Ch	General Chemistry (2)	2	2	-	-	first
181 Ch	Practical Chemistry (1)	1	-	-	3	first
180 Ch	Practical Chemistry (2)	1	-	-	3	first

B.2- Optional courses:

The student selects a number of these courses serve the first level of specialization (6 credit hours to be among them 2 credit hours culture general).

Code No.	Course Title	No. of Units	No. of hours/week			level
			Lect.	Exer.	Prac.	
183 Ch	Applied inorganic chemistry (1)	1	-	2	-	first
183 Ph	Applied physics (1)	1	-	2	-	first
185 Ch	Applied organic chemistry (2)	1	-	2	-	first
185 Ph	Applied physics (2)	1	-	2	-	first
100 Z	General Zoology (1)	2	1	-	2	first
105 Z	General Zoology (2)	2	1	-	2	first
100 B	General Botany (1)	2	1	-	2	first
105 B	General Botany (2)	2	1	-	2	first
100 G	General Geology (1)	2	1	-	2	first
105 G	General Geology (2)	2	1	-	2	first
111 E	General Entomology (1)	2	1	-	2	first
112 E	General Entomology (2)	2	1	-	2	first
11 Fr	Business Administration	2	2	-	-	first
12 Fr	History of Science	2	2	-	-	first
13 Fr	Healthy Nutrition	2	2	-	-	first
14 Fr	Scientific Thinking	2	2	-	-	first
17 Fr	Principles of labor law	1	1	-	-	first
19 Fr	Selected topics from the history of modern Egypt	1	1	-	-	first

- A student who wants to study zoology it is imperative study 100 Z and 105 Z courses.

C- Courses of the bachelor's degree in Biotechnology:

C.1- Courses in second level

Code No.	Course Title		No. of Units	No. of hours/Week			Level
				Lect.	Exer.	Prac.	
First semester							
210 Z	Hematology		3	2	-	2	Second
219 Z	Introduction to biotechnology		3	2	-	2	second
220 Z	Biodiversity		3	2	-	2	second
221 Z	Invertebrate		3	2	-	3	second
241 M	Biostatistics		3	3	-	-	Second
230 G	Rock Forming Minerals	The student select one course	3	2	-	2	Second
291 B	General mi-crobiology		3	2	-	3	Second
No. of Hours			**18**				
Second semester							
204 Z	Histology and histochemistry		3	2	-	3	Second
206 Z	Radiobiology		2	2	-	-	Second
212 Z	Genetic		2	1	-	2	Second
216 Z	Animal toxicology		3	2	-	2	Second
232 Z	Vertebrate comparative anatomy		3	2	-	3	second
222 Z	Environmental safety	The student select one course	3	2	-	2	Second
230 G	Rock Forming Minerals		3	2	-	2	Second
No. of Hours			**16**				

C.2- Courses in third level

Code No.	Course Title	No. of Units	No. of hours/Week			Level
			Lect.	Exer.	Prac.	
First semester						
303 Z	Biochemistry (1)	3	2	-	2	Third
313 Z	Physiology (1)	3	2	-	3	Third
333 Z	Experimental embryology	3	2	-	3	Third
351 Z	Ecology and economic animal	3	2	-	2	Third
323 Ph	Biophysics	3	2	-	3	Third

301 Z	Protozoa	The student select one course	3	2	-	2	Third
352 Z	Marin biology		3	2	-	2	Third
No. of Hours			**18**				
Second semester							
300 Z	Biological field study (Scientific journey)		1	-	-	2	Third
302 Z	Biochemistry (2)		3	2	-	2	Third
312 Z	Cell biology		3	2	-	2	Third
314 Z	Physiology (2)		3	2	-	2	Third
315 Z	Micro-techniques		2	1	-	2	Third
316 Z	Toxicology and pollution		3	2	-	3	Third
334 E	Pesticides	The student select one course	3	2	-	2	Third
344 Ph	Radio- physics		3	3	-	-	Third
No. of Hours			**18**				

C. 3- Courses in fourth level

Code No.	Course Title		No. of Units	No. of hours/Week			Level
				Lect.	Exer.	Prac.	
First semester							
400 Z	Research and essay		2	2	-	-	Fourth
401 Z	Applied genetic		3	2	-	2	Fourth
404 Z	Selective topics in zoology		2	1	-	2	Fourth
410 Z	Physiology (4)		3	2	-	2	Fourth
415 Z	Histopathology		3	2	-	3	Fourth
419 Z	Immunology (1)		3	2	-	3	Fourth
403 Z	Genome	The student select one course	3	2	-	2	Fourth
427 Z	applied biolo-gy		3	2	-	2	Fourth
No. of Hours			**19**				
Second semester							
402 Z	Immunology (2)		3	2	-	2	Fourth
418 Z	Molecular genetics		4	3	-	2	Fourth

420 Z	Parasitology		3	2	-	3	Fourth
436 Z	Molecular embryology		3	2	-	3	Fourth
452 Z	Environmental biology for red sea		3	2	-	3	Fourth
451 Z	Desert ecology.	The student select one course	3	2	-	3	Third
453 E	Integrated Pest Management		3	2	-	2	Third
No. of Hours			**19**				

6- Contents of the Courses

See course specification (Appendix 5)

7- Program admission requirements

- Faculty of Benha Science accepts students who have a high school (the scientific branches) or equivalent according to the admission requirements specified by the Supreme Council of Universities.

- Faculty of Benha Science accepts transfer students from other science faculties; provided that the number of credit hours that were studied not more than 50% of the total number of credit hours necessary for his graduation. The student is exempt from the courses studied by successfully whatever their level.

8- Regulations for progression and program completion:

According to the bylaw of the faculty of Benha Science, the regulations for progression and program completion in any discipline single or double requirement is 140 credit hours at least distributed as follows: -

(1) University requirements for a bachelor's degree in any single discipline or double 8 credit hours is mandatory.
(2) The total requirements for a bachelor's degree in any single discipline or a double is 24 credit hours, including 18 compulsory hours +6 optional hours.
(3) Specialty requirements for a bachelor's degree in any single discipline or a double is determined by Section 108 certified or relevant departments to specialize hour.
(4) leads college students summer training for six weeks in the relevant areas of specialization Applied before graduation to not be training only after the student completed 90 credits at least an hour and do not count him credit hours.
(5) Scientific field trips serve the area of specialization.

- **Joining the Program:**

A - Vice Dean for Education and Student Affairs supervises on the implementation of the registration rules and procedures and prepare menus for each of the study groups, schedule, distribute students on academic advisors, processing cards courses for students which is about cards individual for each course as well as cards total for each student, that academic record data in accredited private records, and the completion of enrollment of students in the first week of the start of the semester.
B - Students may register early, after announcing the results of the end of the spring.
C - Take into account when you log decision student success in Prerequisite if any.
D - A student who was not able to register for compelling reasons approved by the Student Affairs Committee and approved by the College Board to register record late in the additional period for registration (the second week).
E - Student selects one branch to research and essay from two specialized branches.

- **Study load:**

Students are allowed to register in at least 14 credit hours and no more than 19 credit hours per semester. With the exception of the following cases:

A - A student can superior (who has a cumulative average of 3 or more) that adds to it two hours, certified in one semester and a maximum of 8 credit hours throughout the study period in decisions, additional optional requirements, specialization departments, college different, that is added appreciation where to CGPA It is not permitted to be an elective requirement for another decision.
B-The College Board may increase the maximum for the academic workload in the last semester of the student up to a maximum of four credit hours to complete graduation requirements.
C - Not allows the student who has a cumulative rate (1) to register in more than 12 credit hours in a semester.

- **Additions, deletions, withdraw and modify the path:**

A - Any student after the approval of the academic advisor to add or delete scheduled or two until the end of the second week only study and without prejudice to the burden stipulated.
B - Student may withdraw from the study any decision until the end of the seventh week of the start of registration for the semester with the approval of the academic advisor. The record of this decision in the student's academic record estimate "withdrawn" on the condition that the student does not have absenteeism overruns before the withdrawal. And cases before the forced withdrawal over this period the Commission Education and Student Affairs for consideration and approval of the Faculty Council on the withdrawal shall be without prejudice boarding school student.
C - A student may alter the course of the specialization subject to the completion of the requirements of specialization desirable and not counting credit hours, which the student obtained by not located in the area of the requirements of the new specialization and after the approval of the academic advisor and the Committee on Education and Student Affairs and the College Board on this amendment.

- **Stop registration or drop out**

A - Stop registration: the student can apply to stop his registration for one semester and a maximum of four separate classes are connected and for compelling reasons approved by the College Board.
B - Dropout: the student can re-record if he dropouts for maximum two semesters and for compelling reasons approved by the College Board.

- **Attendance:**

A - The instructor shall register the presence of students at the start of each lecture theory or process in a practical period Prepared for by the Student Affairs and delivers this record at the end of the semester to manage the affairs of Students.
B - When the student exceeds the absence of 10% of the scheduled hour's instructor shall notify the Department of Affairs Students to guide the first warning to the student.
C - When the student exceeds the proportion of the absence of 20% of the scheduled hour's instructor shall notify the Department Student Affairs to direct second and final warning to the student.
D - If increased absenteeism 25% of the total scheduled hours and the absence of a student without an acceptable excuse Student Affairs Committee and approved by the College Board, student records estimate" deprived" decision and intervention as a result of failure to calculate the cumulative average of the student.
E - If increased absenteeism was 25% and the absence of the student excuse acceptable to the Commission, Education and Student Affairs and approved by the College Board, student records withdraw from the course.
F - In the case of a request student Add a new decision attendance is calculated from the date of registration.

9- Methods and rules of evaluation of students in rolled in the program:

Rating:

The exam is evaluated each courses at 100 degrees and distributed degrees scheduled as follows:

a. courses which did not include the part "practical"

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	10%	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8), professional (c1 to c10) and general (d1 to d8) skills.
Final Oral Exam	10 %	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8), professional (c1 to c10) and general (d1 to d8) skills
Final Term Examination	80%	Measure knowledge and understanding (a1 to a16) and intellectual (b1 to b8) skills

b. courses practical separate

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	20%	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d8) skills
Final Oral Exam	20 %	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d8) skills
Final practical Examination	60%	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8) and practical (c1 to c10) skills.

c. courses which include part "practical"

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	16%	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d8) skills
Final Oral Exam	12 %	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d8) skills
Final practical Examination	24%	Measure knowledge and understanding (a1 to a16), intellectual (b1 to b8) and practical (c1 to c10) skills
Final Term Examination	48%	Measure knowledge and understanding (a1 to a13) and intellectual (b1 to b8) skills

d. Course search and essay

- 50% of the total score for the course of the various activities carried out by the student during his study of the course.
- 50% of the total scores for the course of the discussion session.

e. Estimated grades and points obtained by the student in each course as follows:

Grade	Symbol	Number of points	Mark
Excellent	A	4	90-100%
	A-	3.7	85-<90%

Very good	B+	3.3	80-<85%
	B	3	75-<80%
Good	B-	2.7	70-<75%
	C+	2.3	65-<70%
Pass	C	2	60-<65%
Failed	F	0	<60%
Absent	F-	0	-

10. Teaching and learning strategies used in the program:

a. outcome based learning strategy.
b. Brainstorming strategy.
c. Problem-solving strategy.
d. Effective discussion strategy.

11. Methods of program evaluation:

Evaluator	Tool	Sample
1- Senior Students	Questionnaire	Not less than 25%
2- Alumni	Questionnaire	Not less than 25%
3- Stakeholders	Questionnaire, workshops, seminars, conferences	Representative for all sectors
4- External Evaluators	Reports	Report 1-2
5- Internal Evaluators	Reports	Report 1-2

Program Coordinator: **Signature:** **Date:**
Name: Dr. Marwa Atef Elewa

Head of the Department: **Signature:** **Date:**
Name: Prof. Dr. Salwa Ebrahem Abd-El Hady

Zoology B.Sc. Program Specification

A. Basic Information

Program Title: Zoology B.Sc. Program
Program Type: Major
Department Responsible: Zoology Department
Coordinator: Dr. Dalia Said Hamza
Internal Evaluator: Dr. Marwa Atef Elewa
External Evaluator: Prof. Dr. Abdel Aziz Diab
Date of the most recent approval of program specification by the faculty council: 9/12/2015 No. (390)

B. Professional Information

1. Program Aims

The overall aims of the program are to provide the graduate with:

a) Advanced subjects related to different branches of zoology.
b) The basic sciences essential for life basic processes.
c) The risk assessment, health and safety regulations and respect for animal life.
d) Designation zoology field survey and laboratory investigations.
e) The relationship and interactions among zoology and the environment.
f) Varieties of different knowledge in zoology that are used in practical manner and report on practice, and critically evaluate the outcomes.
g) The information technology relevant to zoology.
h) Development the skills and attitude necessary for independent learning and participate effectively in research activities or different areas of work.
i) Utilization scientific facts and theories to analyze and interpret data of different method.
j) Participation effectively as a member in teamwork recognizes and respects the views and opinions of the others, as well as exhibiting the sense of beauty and neatness.
k) Basic ethical skills related to the environment preservation and human health and welfare.
l) Choosing appropriate zoological techniques to solve problems on scientific basis.

2. Intended Learning Outcomes (ILO's):

a. Knowledge and Understanding

By the end of Zoology program the graduate should be able to:

a1. Know the theories and applications of behavior, field studies, experimental designs, classification, taxonomy and preservation of animals.
a2. Characterize the structure of various types of animal tissues and organs.
a3. Recognize the comparative anatomical and theories of phylogeny and evolution of animals.
a4. Characterize the complexity and diversity of life processes through the study of organisms, their molecular, cellular and physiological processes, their genetics and evolution, and the interrelationships between them and their environment.
a5. Describe the immunological system and its mechanism of action.
a6. Know the ethics and principles of recent application of genetic engineering in modern biology.
a7. Understand the biodiversity, biogeography, conservation ecology and management of species.
a8. Recognize the main features and characteristics of developmental stages of embryos of different vertebrate taxa.
a9. Know the basics of parasitology and studying of the different parasites and their effects on human and other animals.
a10. Formulate the essential procedures of preparing histological sections and whole mount preparations.
a11. Recognize the classification, morphology, behavior, structural and functional anatomy and the life cycle of organisms.
a12. Know the toxic animals and their effects on the environment and human health and know types of radiation and its application.
a13. Characterize the Physiological and biochemical bases of different organs, functions, metabolic processes and homeostasis.
a14. Understand the structure and function of various types of animal cells in unicellular and multicellular organisms.
a15. Recognize biochemistry, mechanism of organic reactions and characterize the principles, procedures and techniques used in biological and chemical analysis.
a16. Recognize the principles of biophysics and its applications.
a17. Know the facts, concepts, principles and theories of basic sciences (chemistry, physics, geology, mathematics, statistic, computer science, botany, and entomology).

b. Intellectual Skills

By the end of Zoology program, the graduate should be able to:

b1. Analyze and solve problems effectively in all disciplines of Zoology.

b2. Compare between different subjects.
b3. Combine knowledge gained from different sources.
b4. Breakdown, synthesize, reconstruct and reformulate information.
b5. Interpret quantitative data in graphs, figures, tables and other sources of information.
b6. Deduce mechanisms and procedures to deal with scientific problems.
b7. Link and integrate subject-specific theories, concepts and principles.
b8. Apply the investigations in a responsible, safe and ethical manner and pay attention to the risk assessment and safety regulations.

c. Professional and Practical Skills

By the end of Zoology program the graduate should be able to:

c1. Use the laboratory equipment and instruments by responsible, safe and ethical manner to investigate living systems.
c2. Write reports on the data in accordance with the standard scientific guide lines.
c3. Dissect animal samples.
c4. Solve problems by a variety of methods.
c5. Apply appropriate statistical and computational tools to analyze and interpret experimental data in terms of theories relevant to zoology.
c6. Obtain record, collect and analyze the data using appropriate techniques in the field and/or laboratory.
c7. Perform proper sampling, selection and recording of data in the field and/or the laboratory insuring the validity, accuracy, calibration, precision and explicability during collection.
c8. Prepare process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programs, spreadsheets and programs for presenting data visually.
c9. Use the internet and other electronic sources critically as a means of communication and a source of information.
c10. Employ all the gained knowledge and understanding in Zoological practice in a skillful pattern.
c11. Write a report about environmental risks and their suggested solutions.

d. General and transferable Skills

By the end of Zoology program the graduate should be able to:

d1. Use computers and internet for communication, data handling and word processing.
d2. Collaborate effectively with teamwork members to maintain independent and critical thinking, effective time-management and positive communication and cooperation with other members of the teamwork.
d3. Solve problems on scientific basis.
d4. Effectively manage tasks, time, and resources.
d5. Search for information and engage in life-long self learning discipline.
d6. Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities.
d7. Manage their own learning and make use of scholarly reviews and primary scientific literature.
d8. Modify sense of beauty and neatness.

3- Academic standards of the program

The program outcomes are derived from the Egyptian National Academic Reference Standards (NARS) published by the National Authority for Quality Assurance and Accreditation of Education (January, 2009 1st Edition) for Biological Sciences (Appendices 1, 2, and 3).

.

4- Reference indices (Benchmarks)

Not utilized.

5- Program structure and contents

a- Program duration: four levels (8 semesters)

b- Distribution of Credit hours within program structure

Program	Credit hours		
	Compulsory	**Optionally**	**Total**
University Requirements	8	_	8
College Requirements	18	6	24
Major Zoology requirements	90	18	108
Total	116	24	140

c- Percentage of courses within program

Program	Credit hours	Percentage

Basic sciences	32	22.86 %
Humanities (including language)	5	3.57 %
Specialized courses	98	70 %
Computer and IT	5	3.57 %
Total	140	100 %

- Leads all college students after passing the 100 credit hours practical training for 6 weeks in companies or factories or related bodies specialization or in the faculty, without calculating the credit hours, the Academic guider choose the time appropriate for training during the summer holidays.
- Some courses may include scientific expeditions or field serves the area of specialization.

d- Program Courses

- Symbols in the list and their meanings

Connotation	Symbol
University requirement	Ur
Faculty requirement	Fr
Botany	B
Chemistry	Ch
Entomology	E
Geology	G
Mathematics	M
Mathematical Statistics	MS
Physics	Ph
Zoology	Z

I- University Requirements for first level students (8 credit hours)

Course Code	Course Name	Course Requirements	No. of Hours		
			Lecture	Practice/ Training approved	Credits
015 Ur	English(١)	—	٢	-	٢
030 Ur	Computer Science (١)	—	٢	٢	٣

040 Ur	Computer Science (٢)	030 Ur	١	٢	٢
050 Ur	Human Rights	—	١	-	١

II- College Requirements (24 credit hours)

A- Compulsory courses for first level students (18 credit hours)

Course Code	Course Name	Course Requirements	No. of Hours		
			Lecture	Practice/ Training approved	Credits
100 M	General mathematics (1)	—	٢	— /٢	٣
105 M	General mathematics (2)	100 M	٢	— / ٢	٣
100 Ph	General physics (1)	—	٢	- / -	٢
105 Ph	General physics (2)	100 Ph	٢	- / -	٢
181 Ph	Practical physics (1)	—	—	٣/ -	١
180 Ph	Practical physics (2)	181 Ph	—	٣/ -	١
100 Ch	General chemistry (1)	—	٢	- / -	٢
105 Ch	General chemistry (2)	100 Ch	٢	- /-	٢
181 Ch	Practical chemistry (1)	—	—	٣/ -	١
180 Ch	Practical chemistry (2)	181 Ch	—	٣ / -	١

B- Optional Courses for first level students: The students choose a number of these courses serve specialization (6 credit hours to be among them 2 credit hours general culture courses).

Course Code	Course Name	Course Requirements	No. of Hours		
			Lecture	Practice/ Training approved	Credits
183 Ch	Applied inorganic chemistry (1)	—	—	-/٢	١
183 Ph	Applied physics (1)	—	—	-/٢	١
185 Ch	Applied organic chemistry (2)	—	—	-/٢	١
185 Ph	Applied physics (2)	—	—	-/٢	١
100 Z	General Zoology (1)	—	١	٢/-	٢
105 Z	General Zoology (2)	100 Z	١	٢/-	٢
100 B	General Botany (1)	—	١	٢/-	٢
105 B	General Botany (2)	100 B	١	٢/-	٢
100 G	General Geology (1)	—	١	٢/-	٢

105 G	General Geology (2)	100 G	١	٢/-	٢
111 E	General Entomology (1)	—	١	٢/-	٢
112 E	General Entomology (2)	111 E	١	٢/-	٢
11 Fr	Business Administration	—	٢	–	٢
12 Fr	History of Science	—	٢	–	٢
13 Fr	Healthy Nutrition	—	٢	–	٢
14 Fr	Scientific Thinking	—	٢	–	٢
17 Fr	Principles of labor law	—	١	–	١
19 Fr	Selected topics from the history of modern Egypt	—	١	–	١

Note: The student who studies Zoology requires him to study 100 Z and 105 Z courses.

III- Courses of bachelor's degree in Zoology

A- Second level courses

Course Code	Course Name		Course Requirements	No. of Hours		
				Lecture	Practice/ Training approved	Credits
First semester						
219 Z	Introduction to biotechnology		105 Z	٢	٢/-	٣
221 Z	Invertebrate		100 Z, 105 Z	٢	٣/-	٣
223 Z	Ecological studies		105 Z	٢	٢/-	٣
225 Ph	The principles of modern physics		105 Ph	٢	٢/-	٣
241 M	Biostatistics		105 M	٣	-/-	٣
291 B	General microbiology	The student choose one course	-	٢	٣/-	٣
230 G	Rock Forming Minerals		-	٢	٢/-	٣
No. of Hours						١٨
Second semester						
210 Z	Haematology		105 Z	٢	٢/-	٣
212 Z	Genetics		100 Z, 105 Z	١	٢/-	٢
216 Z	Animal toxicology		105 Z	٢	٢/-	٣
220 Z	Biodiversity		100 Z	١	٢/-	٢
222 Z	Environmental safety		223 Z	٢	٢/-	٣
232 Z	Physiological Anatomy of		100 Z, 105 Z	٢	٣/-	٣

	Chordata					
213 Ch	Aliphatic Organic Chemistry 2	The student choose one course	105 Ch	٢	١/-	٢
230 G	Rock Forming Minerals		-	٢	٢/-	٣
No. of Hours						١٨

B- Third level courses

Course Code	Course Name		Course Requirements	No. of Hours		
				Lecture	Practice/ Training approved	Credits
First semester						
311 Z	Immunity and radiation biology		105 Z	٢	٢/-	٣
313 Z	Physiology		100 Z, 105 Z	٢	٣/-	٣
321 Z	Invertebrate and Protozoa		221 Z	٢	3/-	٣
331 Z	Embryology and Experimental embryology		105 Z, 232 Z	٢	3/-	٣
351 Z	Ecology and economic animal		100 Z, 105 Z, 220 Z	2	2/-	٣
323 Z	Parasites and fish diseases	The student choose one course	221 Z, 232 Z	٢	2/-	٣
333 Z	Experimental embryology		212 Z	٢	٢/-	٣
No. of Hours						١٨
Second semester						
300 Z	Biological field study (Scientific journey)		-	-	٢/-	1
303 Z	Biochemistry (1)		-	2	٢/-	3
312 Z	Cell biology		100 Z, 105 Z, 212 Z	٢	٢/-	٣
315 Z	Micro-techniques		105 Z	١	٢/-	٢
352 Z	Marine biology		351 Z	٢	٢/-	٣
323 Ph	Biophysics		105 Ph	٢	٣/-	٣
318 Z	Adaptation physiology	The student choose one course	313 Z	٢	2/-	3
334 Z	Freshwater biology		105 Z	٢	٢/-	٣
No. of Hours						١٨

C- Fourth level courses

Course Code	Course Name		Course Requirements	No. of Hours		
				Lecture	Practice/ Training approved	Credits
First semester						
400 Z	Research and essay		-	٢	-/-	٢
411 Z	Advanced Physiology (1)		313 Z	٢	٣/-	٣
413 Z	Advanced histology and Histochemistry		312 Z	٢	٣/-	٣
415 Z	Histopathology		312 Z	٢	٣/-	٣
425 Z	Fish farming and Aquaculture		351 Z	١	-/-	١
431 Z	Fish biology and animal behavior		232 Z	٢	٢/-	٣
401 Z	Applied genetic	The student choose one course	212 Z	٢	٢/-	٣
427 Z	applied biology		212 Z, 315 Z	٢	٢/-	٣
No. of Hours						١٨
Second semester						
404 Z	Selective topics in zoology		approval of the department	٢	٢/-	٣
412 Z	Advanced Physiology (2)		411 Z	٢	٣/-	٣
414 Z	Immunology and Parasitology		411 Z, 321 Z	٢	٣/-	٣
416 Z	Advanced genetics and genetic engineering		212 Z	٢	٢/-	٣
432 Z	Comparative anatomy and evolution		331 Z, 232 Z	٢	٣/-	٣
410 Z	Physiology (4)	The student choose one course	232 Z, 411 Z	٢	٢/-	٣
418 Z	Molecular genetics		-	٢	٢/-	٣
No. of Hours						١٨

7- Program admission requirements

- Faculty of Benha Science accepts students who have a high school (the scientific branches) or equivalent according to the admission requirements specified by the Supreme Council of Universities.

- Faculty of Benha Science accepts transfer students from other science faculties; provided that the number of credit hours that were studied not more than 50% of the total number of credit hours nec-

essary for his graduation. The student is exempt from the courses studied by successfully whatever their level.

8- Regulations for progression and program completion:

According to the bylaw of the faculty of Benha Science, the regulations for progression and program completion in any discipline single or double requirement is 140 credit hours at least distributed as follows: -

(1) University requirements for a bachelor's degree in any single discipline or double 8 credit hours is mandatory.
(2) The total requirements for a bachelor's degree in any single discipline or a double is 24 credit hours, including 18 compulsory hours +6 optional hours.
(3) Specialty requirements for a bachelor's degree in any single discipline or a double is determined by Section 108 certified or relevant departments to specialize hour.
(4) leads college students summer training for six weeks in the relevant areas of specialization Applied before graduation to not be training only after the student completed 90 credits at least an hour and do not count him credit hours.
(5) Scientific field trips serve the area of specialization.

- **Joining the Program:**

A - Vice Dean for Education and Student Affairs supervises on the implementation of the registration rules and procedures and prepare menus for each of the study groups, schedule, distribute students on academic advisors, processing cards courses for students which is about cards individual for each course as well as cards total for each student, that academic record data in accredited private records, and the completion of enrollment of students in the first week of the start of the semester.
B - Students may register early, after announcing the results of the end of the spring.
C - Take into account when you log decision student success in Prerequisite if any.
D - A student who was not able to register for compelling reasons approved by the Student Affairs Committee and approved by the College Board to register record late in the additional period for registration (the second week).
E - Student selects one branch to research and essay from two specialized branches.

- **Study load:**

Students are allowed to register in at least 14 credit hours and no more than 19 credit hours per semester. With the exception of the following cases:

A - A student can superior (who has a cumulative average of 3 or more) that adds to it two hours, certified in one semester and a maximum of 8 credit hours throughout the study period in decisions, additional optional requirements, specialization departments, college different, that is added appreciation where to CGPA It is not permitted to be an elective requirement for another decision.
B-The College Board may increase the maximum for the academic workload in the last semester of the student up to a maximum of four credit hours to complete graduation requirements.
C - Not allows the student who has a cumulative rate (1) to register in more than 12 credit hours in a semester.

- **Additions, deletions, withdraw and modify the path:**

A - Any student after the approval of the academic advisor to add or delete scheduled or two until the end of the second week only study and without prejudice to the burden stipulated.

B - Student may withdraw from the study any decision until the end of the seventh week of the start of registration for the semester with the approval of the academic advisor. The record of this decision in the student's academic record estimate "withdrawn" on the condition that the student does not have absenteeism overruns before the withdrawal. And cases before the forced withdrawal over this period the Commission Education and Student Affairs for consideration and approval of the Faculty Council on the withdrawal shall be without prejudice boarding school student.
C - A student may alter the course of the specialization subject to the completion of the requirements of specialization desirable and not counting credit hours, which the student obtained by not located in the area of the requirements of the new specialization and after the approval of the academic advisor and the Committee on Education and Student Affairs and the College Board on this amendment.

- **Stop registration or drop out**

A - Stop registration: the student can apply to stop his registration for one semester and a maximum of four separate classes are connected and for compelling reasons approved by the College Board.
B - Dropout: the student can re-record if he dropouts for maximum two semesters and for compelling reasons approved by the College Board.

- **Attendance:**

A - The instructor shall register the presence of students at the start of each lecture theory or process in a practical period Prepared for by the Student Affairs and delivers this record at the end of the semester to manage the affairs of Students.
B - When the student exceeds the absence of 10% of the scheduled hour's instructor shall notify the Department of Affairs Students to guide the first warning to the student.
C - When the student exceeds the proportion of the absence of 20% of the scheduled hour's instructor shall notify the Department Student Affairs to direct second and final warning to the student.
D - If increased absenteeism 25% of the total scheduled hours and the absence of a student without an acceptable excuse Student Affairs Committee and approved by the College Board, student records estimate" deprived" decision and intervention as a result of failure to calculate the cumulative average of the student.
E - If increased absenteeism was 25% and the absence of the student excuse acceptable to the Commission, Education and Student Affairs and approved by the College Board, student records withdraw from the course.
F - In the case of a request student Add a new decision attendance is calculated from the date of registration.

9- Methods and rules of evaluation of students in rolled in the program:

Rating:

The exam is evaluated each courses at 100 degrees and distributed degrees scheduled as follows:

a. courses which did not include the part "practical"

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	10%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), professional (c1 to c10) and general (d1 to d7) skills.
Final Oral Exam	10 %	Measure knowledge and understanding (a1 to

		a13), intellectual (b1 to b8), professional (c1 to c10) and general (d1 to d7) skills
Final Term Examination	80%	Measure knowledge and understanding (a1 to a13) and intellectual (b1 to b8) skills

b. courses practical separate

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	20%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final Oral Exam	20 %	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final practical Examination	60%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8) and practical (c1 to c10) skills.

c. courses which include part "practical"

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	16%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final Oral Exam	12 %	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final practical Examination	24%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8) and practical (c1 to c10) skills
Final Term Examination	48%	Measure knowledge and understanding (a1 to a13) and intellectual (b1 to b8) skills

d. Course search and essay

- 50% of the total score for the course of the various activities carried out by the student during his study of the course.
- 50% of the total scores for the course of the discussion session.

e. Estimated grades and points obtained by the student in each course as follows:

Grade	Symbol	Number of points	Mark
Excellent	A	4	90-100%

	A-	3.7	85-<90%
Very good	B+	3.3	80-<85%
	B	3	75-<80%
Good	B-	2.7	70-<75%
	C+	2.3	65-<70%
Pass	C	2	60-<65%
Failed	F	0	<60%
Absent	F-	0	-

10. Teaching and learning strategies used in the program:

a. outcome based learning strategy.
b. Brainstorming strategy.
c. Problem-solving strategy.
d. Effective discussion strategy.

11. Methods of program evaluation:

Evaluator	Tool	Sample
1- Senior Students	Questionnaire	Not less than 25%
2- Alumni	Questionnaire	Not less than 25%
3- Stakeholders	Questionnaire, workshops, seminars, conferences	Representative for all sectors
4- External Evaluators	Reports	Report 1-2
5- Internal Evaluators	Reports	Report 1-2

Program Coordinator: **Signature:** **Date:**
Name: Dr. Dalia Said Hamza

Head of the Department: **Signature:** **Date:**
Name: Prof. Dr. Salwa Ebrahem Abd-El Hady

Zoology and Chemistry B.Sc. Program Specification

A. Basic Information

Program Title: Zoology and Chemistry B.Sc. Program
Program Type: Major
Department Responsible: Zoology Department
Coordinator: Dr. Doaa Sabry Ibrahim
Internal Evaluator: Dr. Marwa Atef Elewa
External Evaluator: Prof. Dr. Abdel Aziz Diab
Date of the most recent approval of program specification by the faculty council: 9/12/2015 No. (390)

B. Professional Information

1. Program Aims

The overall aims of the program are to provide the graduate with:

a) The basic sciences essential for life basic processes.
b) Advanced subjects related to different branches of chemistry and zoology.
c) The relationship and interactions among chemistry, zoology and the environment.
d) Knowledge of zoology and chemistry in a practical manner and report on practice, and critically evaluate the outcomes.
e) The skills and attitude necessary for independent learning and participate effectively in research activities or different areas of work.
f) Scientific facts and theories to analyze and interpret data of different method.
g) Participation effectively as a member in teamwork recognizes and respect the views and opinions of the others, as well as exhibiting the sense of beauty and neatness.
h) Basic ethical skills related to the environment preservation and human health and welfare.

2. Intended Learning Outcomes (ILO's)

a. Knowledge and Understanding

By the end of the program, the graduate will be able to:

a.1 Characterize the structure of various types of animal tissues and organs.
a.2 Describe the physiological and immunological systems, their functions and their mechanism of action in animals.
a.3 Recognize different ecological systems, pollution and effect of pollution on biological system.
a.4 Recognize theories, facts, concepts, fundamentals and techniques related to genetics.
a.5 Describe cell organelles, division and mechanism of death.
a.6 Recognize gametes, fertilization and embryological stages of growth in some animals.
a.7 Identify the classification, morphology, behavior, structural and functional anatomy and the life cycle of organisms.

a.8 Recognize organic compounds and mechanism of organic reactions
a.9 Characterize properties of elements.
a.10 Recognize the principles of physical chemistry and its applications.
a.11 Characterize the principles, procedures and techniques used in chemical analysis.
a.12 Illustrate the properties of petroleum and the refining process.
a.13 Recognize the essential facts, major concepts, principles, and theories in basic sciences (entomology, physics, geology, botany and mathematics) and other sciences to understand the recent advances in zoology and chemistry.

b. Intellectual Skills

By the end of the program, the graduate will be able to:

b.1 Interpret a piece of information in the light of evidence provided by zoology, chemistry and other sciences.
b.2 Integrate subject-specific theories, concepts and principles.
b.3 Deduce mechanisms and procedures to deal with scientific problems.
b.4 Interpret quantitative data in graphs, figures, tables and other sources of information.
b.5 Apply the investigations in a responsible, safe manner, paying attention to risk assessment and safety regulation.
b.6 Breakdown, synthesize, reconstruct and reformulate information.
b.7 Combine knowledge gained from different sources.
b.8 Compare between different subjects .

c. Professional and Practical Skills

By the end of the program, the graduate will be able to:

c.1 Write reports on the data in accordance with the standard scientific guide lines.
c.2 Use the laboratory equipment and instruments by responsible, safe and ethical manner to investigate living systems.
c.3 Solve problems by a variety of methods.
c.4 Investigate the physical or chemical properties of compounds.
c.5 Apply appropriate statistical and computational tools to analyze and interpret experimental data in terms of theories relevant to chemistry and zoology.
c.6 Describe various biological, chemical and others samples.
c.7 Analyze various biological, chemical and others samples.
c.8 Identity various biological, chemical and others samples.
c.9 Draw various biological, chemical and others structures.
c.10 Dissect animal samples.

d. General Skills

By the end of the program, the graduate will be able to:

d.1 Use computers and internet for communication, data handling and word processing.
d.2 Collaborate effectively with teamwork members to maintain independent and critical thinking, effective time-management and positive communication and cooperation with other members of the teamwork.
d.3 Solve problems on scientific basis.
d.4 Effectively manage tasks, time, and resources.

d.5 Search for information and engage in life-long self learning discipline.
d.6 Help raising public awareness of the benefits of conserving intellectual property rights and scientific patents on the individuals and communities.
d.7 Modify sense of beauty and neatness.

3- Academic standards of the program

The program outcomes are derived from the Egyptian National Academic Reference Standards (NARS) for double programs in Science Facilities (Zoology & Chemistry) in 2009 (Appendices 1, 2,3 and 4).

4- Reference indices (Benchmarks)

Not utilized.

5- Program structure and contents

a- Program duration: four levels (8 semesters)

b- Program structure:

Program	Credit hours
Compulsory	118
Optional	18
Elective	4
Total	140

Program	Credit hours	Percentage
Basic sciences	33	23.57 %
Humanities (including language)	5	3.57 %
Specialized courses	97	69.29%
Computer and IT	5	3.57%
Total	140	100 %

- Field training: 6 weeks

c- Program Courses:

- Symbols in the list and their meanings

Connotation	Symbol
University requirement	Ur
Faculty requirement	Fr
Botany	B
Chemistry	Ch
Entomology	E
Geology	G
Mathematics	M
Mathematical Statistics	MS
Physics	Ph
Zoology	Z

- **University requirement courses:**

The student studies (8 credit hours) in first level

Code No.	Course Title	No. of Units	No. of hours/week			level
			Lect.	Exer.	Prac.	
015 Ur	English (1)	2	2	-	-	first
030 Ur	Computer Science (1)	3	2	-	2	first
040 Ur	Computer Science (2)	2	1	-	2	first
050 Ur	Human Rights	1	1	-	-	first

- **Faculty requirement courses:**

- Compulsory courses:

The student studies (18 hours) in first level

Code No.	Course Title	No. of Units	No. of hours/Week			Level
			Lect.	Exer.	Prac.	
100 M	General Mathematics (1)	3	2	2	-	First
105 M	General Mathematics (2)	3	2	2	-	First
100 Ph	General Physics (1)	2	2	-	-	First
105 Ph	General Physics (2)	2	2	-	-	First
181 Ph	Practical Physics (1)	1	-	-	3	First
180 Ph	Practical Physics (2)	1	-	-	3	First
100 Ch	General Chemistry (1)	2	2	-	-	First
105 Ch	General Chemistry (2)	2	2	-	-	First
181 Ch	Practical Chemistry (1)	1	-	-	3	first
180 Ch	Practical Chemistry (2)	1	-	-	3	first

- **Optional courses:**

The student selects a number of these courses serve the first level of specialization (6 credit hours to be among them 2 credit hours culture general)

Code No.	Course Title	No. of Units	No. of hours/week			level
			Lect.	Exer.	Prac.	
183 Ch	Applied inorganic chemistry (1)	1	-	2	-	first
183 Ph	Applied physics (1)	1	-	2	-	first
185 Ch	Applied organic chemistry (2)	1	-	2	-	first
185 Ph	Applied physics (2)	1	-	2	-	first
100 Z	General Zoology (1)	2	1	-	2	first
105 Z	General Zoology (2)	2	1	-	2	first
100 B	General Botany (1)	2	1	-	2	first
105 B	General Botany (2)	2	1	-	2	first
100 G	General Geology (1)	2	1	-	2	first
105 G	General Geology (2)	2	1	-	2	first
111 E	General Entomology (1)	2	1	-	2	first
112 E	General Entomology (2)	2	1	-	2	first

11 Fr	Business Administration	2	2	-	-	first
12 Fr	History of Science	2	2	-	-	first
13 Fr	Healthy Nutrition	2	2	-	-	first
14 Fr	Scientific Thinking	2	2	-	-	first
17 Fr	Principles of labor law	1	1	-	-	first
19 Fr	Selected topics from the history of modern Egypt	1	1	-	-	first

- A student who wants to study zoology it is imperative study 100 Z and 105 Z courses.

▪ Courses of the bachelor's degree in Zoology and Chemistry:

- Courses in second level

Code No.	Course Title		No. of Units	No. of hours/Week			Level
				Lect.	Exer.	Prac.	
First semester							
215 Ch	Environmental green organic chemistry		2	2	-	-	second
217 Ch	Aliphatic organic chemistry		3	2	-	3	second
231 Ch	Thermodynamic chemistry		2	2	-	-	second
221 Z	Invertebrate		3	2	-	3	second
235 G	Crystallography and optical mineralogy		3	2	-	2	second
241 MS	Biostatistics		3	3	-	-	second
230 G	Rock Forming Minerals	The student select one course	3	2	-	2	second
291 B	General microbiol-ogy		3	2	-	3	second
No. of Hours			**19**				
Second semester							
212 Ch	Aromatic organic chemistry (1)		2	2	1	-	second
222 Ch	Inorganic chemistry		2	2	1	-	second
234 Ch	Electrochemistry		2	2	1	-	second
242 Ch	Analytical chemistry		3	2	-	3	second
222 Z	Environmental safety		3	2	-	2	second
232 Z	Physiological anatomy of Chor-data		3	2	-	3	second
206 Z	Radiobiology	The student select one course	2	2	-	-	second
212 Z	Genetic		2	1	-	2	second
No. of Hours			**17**				

- Courses in third level

Code No.	Course Title		No. of Units	No. of hours/Week			Level
				Lect.	Exer.	Prac.	
First semester							
317 Ch	Organic Spectroscopic Chemistry		3	2	-	3	third
323 Ch	Transition elements and Coordination Chemistry		2	2	-	-	third
333 Ch	Chemical kinetics		1	1	-	-	third
313 Z	Physiology		3	2	-	3	third
331 Z	Embryology and experimental embryology		3	2	-	3	third
353 Z	Ecology, fauna and marine biology		3	2	-	2	third
319 Ch	Petroleum and petrochemistry	The student select one course	3	2	-	3	third
325 Ch	Physical chemistry (3)		3	3	-	-	third
No. of Hours			**18**				
Second semester							
310 Ch	Organic reaction mechanism (2)		2	2	1	-	third
338 Ch	Surface, catalysis, colloid and solid state chemistry		2	2	-	-	third
300 Z	Biological field study (Scientific journey)		1	-	-	2	third
303 Z	Biochemistry (1)		3	2	-	3	third
312 Z	Cell biology		3	2	-	2	third
323 Ph	Biophysics		3	2	-	3	third
326 Ch	Inorganic chemistry (3)	The student select one course	3	3	-	-	third
342 Ch	Analytical chemistry (2)		3	2	-	3	third
No. of Hours			**17**				

- Courses in fourth level

Code No.	Course Title		No. of Units	No. of hours/Week			Level
				Lect.	Exer.	Prac.	
First semester							
419Ch	Chemistry of carbohydrates, amino acids and lipids		3	2	-	3	fourth
433 Ch	Applied electrochemistry (2)		1	1	-	-	fourth
443 Ch	Applied electrochemistry (2)		1	1	-	-	fourth
413 Z	Advanced histology and histo-chemistry		3	2	-	3	fourth
431 Z	Fish biology and animal behav-ior		3	2	-	2	fourth
433 Z	Comparative anatomy		3	2	-	3	fourth
453 E	Integrated pest management	The student select one course	3	2	-	2	fourth
365 G	Hydrogeology		3	2	-	2	fourth
No. of Hours			**19**				
Second semester							
400 Z or Ch	Research and essay		2	-	-	-	fourth
424 Ch	Advanced inorganic chemistry		2	2	-	-	fourth
404 Z	Special courses in Zoology		3	2	-	2	fourth
412 Z	Advanced physiology (2)		3	2	-	3	fourth
414 Z	Immunology and parasitology		3	2	-	3	fourth
416 Z	Advanced genetics and genetic engineering		3	2	-	2	fourth
418Ch	Chemistry of Heterocyclic Compounds	The student select one course	2	2	-	-	fourth
312 Ch	Organic Spectro-scopic Chemistry (1)		2	2	-	-	fourth
No. of Hours			**18**				

6- Contents of the Courses

See course specification ((Appendices 5 and 6).

7- Program admission requirements

- Faculty of Benha Science accepts students who have a high school (the scientific branches) or equivalent according to the admission requirements specified by the Supreme Council of Universities.

- Faculty of Benha Science accepts transfer students from other science faculties; provided that the number of credit hours that were studied not more than 50% of the total number of credit hours necessary for his graduation. The student is exempt from the courses studied by successfully whatever their level.

8- Regulations for progression and program completion:

According to the bylaw of the faculty of Benha Science, the regulations for progression and program completion in any discipline single or double requirement is 140 credit hours at least distributed as follows: -

(1) University requirements for a bachelor's degree in any single discipline or double 8 credit hours is mandatory.
(2) The total requirements for a bachelor's degree in any single discipline or a double is 24 credit hours, including 18 compulsory hours +6 optional hours.
(3) Specialty requirements for a bachelor's degree in any single discipline or a double is determined by Section 108 certified or relevant departments to specialize hour.
(4) leads college students summer training for six weeks in the relevant areas of specialization Applied before graduation to not be training only after the student completed 90 credits at least an hour and do not count him credit hours.
(5) Scientific field trips serve the area of specialization.

- **Joining the Program:**

A - Vice Dean for Education and Student Affairs supervises on the implementation of the registration rules and procedures and prepare menus for each of the study groups, schedule, distribute students on academic advisors, processing cards courses for students which is about cards individual for each course as well as cards total for each student, that academic record data in accredited private records, and the completion of enrollment of students in the first week of the start of the semester.
B - Students may register early, after announcing the results of the end of the spring.
C - Take into account when you log decision student success in Prerequisite if any.
D - A student who was not able to register for compelling reasons approved by the Student Affairs Committee and approved by the College Board to register record late in the additional period for registration (the second week).
E - Student selects one branch to research and essay from two specialized branches.

- **Study load:**

Students are allowed to register in at least 14 credit hours and no more than 19 credit hours per semester. With the exception of the following cases:

A - A student can superior (who has a cumulative average of 3 or more) that adds to it two hours, certified in one semester and a maximum of 8 credit hours throughout the study period in decisions, additional optional requirements, specialization departments, college different, that is added appreciation where to CGPA It is not permitted to be an elective requirement for another decision.

B-The College Board may increase the maximum for the academic workload in the last semester of the student up to a maximum of four credit hours to complete graduation requirements.
C - Not allows the student who has a cumulative rate (1) to register in more than 12 credit hours in a semester.

- **Additions, deletions, withdraw and modify the path:**

A - Any student after the approval of the academic advisor to add or delete scheduled or two until the end of the second week only study and without prejudice to the burden stipulated.
B - Student may withdraw from the study any decision until the end of the seventh week of the start of registration for the semester with the approval of the academic advisor. The record of this decision in the student's academic record estimate "withdrawn" on the condition that the student does not have absenteeism overruns before the withdrawal. And cases before the forced withdrawal over this period the Commission Education and Student Affairs for consideration and approval of the Faculty Council on the withdrawal shall be without prejudice boarding school student.
C - A student may alter the course of the specialization subject to the completion of the requirements of specialization desirable and not counting credit hours, which the student obtained by not located in the area of the requirements of the new specialization and after the approval of the academic advisor and the Committee on Education and Student Affairs and the College Board on this amendment.

- **Stop registration or drop out**

A - Stop registration: the student can apply to stop his registration for one semester and a maximum of four separate classes are connected and for compelling reasons approved by the College Board.
B - Dropout: the student can re-record if he dropouts for maximum two semesters and for compelling reasons approved by the College Board.

- **Attendance:**

A - The instructor shall register the presence of students at the start of each lecture theory or process in a practical period Prepared for by the Student Affairs and delivers this record at the end of the semester to manage the affairs of Students.
B - When the student exceeds the absence of 10% of the scheduled hour's instructor shall notify the Department of Affairs Students to guide the first warning to the student.
C - When the student exceeds the proportion of the absence of 20% of the scheduled hour's instructor shall notify the Department Student Affairs to direct second and final warning to the student.
D - If increased absenteeism 25% of the total scheduled hours and the absence of a student without an acceptable excuse Student Affairs Committee and approved by the College Board, student records estimate" deprived" decision and intervention as a result of failure to calculate the cumulative average of the student.
E - If increased absenteeism was 25% and the absence of the student excuse acceptable to the Commission, Education and Student Affairs and approved by the College Board, student records withdraw from the course.
F - In the case of a request student Add a new decision attendance is calculated from the date of registration.

9- Methods and rules of evaluation of students in rolled in the program: (Appendix 7).

Rating:

The exam is evaluated each courses at 100 degrees and distributed degrees scheduled as follows:

a. courses which did not include the part "practical"

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	10%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), professional (c1 to c10) and general (d1 to d7) skills.
Final Oral Exam	10 %	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), professional (c1 to c10) and general (d1 to d7) skills
Final Term Examination	80%	Measure knowledge and understanding (a1 to a13) and intellectual (b1 to b8) skills

b. courses practical separate

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	20%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final Oral Exam	20 %	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final practical Examination	60%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8) and practical (c1 to c10) skills.

c. courses which include part "practical"

Method of Assessment	Weighting	learning outcomes assessed
Midterm exam & Semester work	16%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final Oral Exam	12 %	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8), practical (c1 to c10) and general (d1 to d7) skills
Final practical Examination	24%	Measure knowledge and understanding (a1 to a13), intellectual (b1 to b8) and practical (c1 to c10) skills
Final Term Examination	48%	Measure knowledge and understanding (a1 to a13) and intellectual (b1 to b8) skills

d. Course search and essay

- 50% of the total score for the course of the various activities carried out by the student during his study of the course.
- 50% of the total scores for the course of the discussion session.

e. Estimated grades and points obtained by the student in each course as follows:

Grade	Symbol	Number of points	Mark
Excellent	A	4	90-100%
	A-	3.7	85-<90%
Very good	B+	3.3	80-<85%
	B	3	75-<80%
Good	B-	2.7	70-<75%
	C+	2.3	65-<70%
Pass	C	2	60-<65%
Failed	F	0	<60%
Absent	F-	0	-

10. Teaching and learning strategies used in the program:

a. outcome based learning strategy.
b. Brainstorming strategy.
c. Problem-solving strategy.
d. Effective discussion strategy.

11. Methods of program evaluation:

Evaluator	Tool	Sample
1- Senior Students	Questionnaire	Not less than 25%
2- Alumni	Questionnaire	Not less than 25%
3- Stakeholders	Questionnaire, workshops, seminars, conferences	Representative for all sectors
4- External Evaluators	Reports	Report 1-2
5- Internal Evaluators	Reports	Report 1-2

Program Coordinator: **Signature:** **Date:**
Name: Dr. Doaa Sabry Ibrahim

Head of the Department: **Signature:** **Date:**
Name: Prof. Dr. Salwa Ebrahem Abd-El Hady