Credit Hours System Bylaws

Faculty of Science
Assiut University

Vision

The faculty of Science at Assiut University is a distinguished national faculty which supplies the society with qualified graduates who are prepared to be creative. The faculty is distinguished with performing high quality researches to meet the technical, scientific, industrial, governmental, and societal needs.

Mission

The faculty of science at Assiut University is a corporation for higher education and scientific research in the field of basic sciences to fulfill the mission of the University complying with the moral and religious ethics, through:

- Preparing generations of researchers and specialists in the scientific research for educational and industrial centers.
- Offering the best educational services in basic science for the B.Sc. students to acquire the required skills through education programs based on the national and international standards.
- Participating in the development of basic sciences (Mathematics, Computer Science, Physics, Chemistry, Biology and Geology) via the post-graduate research programs.
- Exploiting the faculty human resources, research facilities and expertise to solve environmental problems and to enhance community development.
- Playing a unique role in south valley development studies and performing projects for escaping from the narrow valley in the south of Egypt.

Goals

- Building an educational institution that is able to cope with and accommodate the continuing evolution in basic sciences and applications.
- Graduating distinguished generations that are able to compete in the labor market and assimilate modern advanced technology through academic local and global standards and benchmarks.
- Developing and modernization of scientific and research programs.
- Playing an influential role in the development of society through training and educational programs, counseling, and interaction between the institution and community.

- Working on the creation and development of international relations, especially Arabic and African countries through scientific and cultural exchanges.
- Strengthening the national loyalty and maintaining the principles of society and the noble human values.

About Faculty of Science, Assiut University

Chapter (1): Faculty Departments and Scientific Degrees

Article (l)

The Faculty of Science at Assiut University includes the following departments:

1. Mathematics Department
2. Physics Department
3. Chemistry Department
4. Geology Department
5. Botany Department
6. Zoology department

Article (2)

Based on the recommendation of the Faculty Board, Assiut University grants the following scientific degrees and Diplomas:

- B.Sc. Degree in one of the specializations listed in Article (8) in this regulation.
- Diploma of higher studies.
- M. Sc. Degree
- Ph. D. Degree
- D. Sc. Degree

Chapter (2): B. Sc. Degree of Science

Article (3)

The faculty admission is determined by Students scores in the Egyptian Secondary School Certificate or an equivalent certificate, geographical distribution, and the acts issued by the Supreme Council of the Egyptian Universities in this respect.

This regulation is effective for freshmen/first year students in the next academic year after approval.

Article (4)

a) The credit hour system (2 Semesters) is the system of study adopted by the faculty.
b) The period of study for undergraduates consists of four class-years at least

Article (5)

The academic year is divided into two semesters. Each semester extends to 17 weeks. A summer semester extended for 8 weeks is a subject for approval by the faculty council.

Article (6)

The semester extends to 17 weeks and includes:
A) one week for registration.
B) Fourteen weeks of study.
C) Two weeks for the final written exams.

Article (7)

B.Sc. degree is granted for the students who successfully pass the required credit hours (138) according to the study scheme of every learning program and with a cumulative average of at least 2.0.

Article (8)

A) The B.Sc. special degree (Single specialization) is granted in one of the following specializations:

1. Mathematics	2. Statistics	3. Computer Sciences	4. Physics
5. Chemistry	6.Geology	7.Geophysics	8.Petroleum geology
9. Botany	10. Microbiology	11. Zoology	12. Entomology
13. Fisheries & Fishes			

B) The B.Sc. general degree (double specialization) is granted in the following specializations:

1. Physics & Electronics*	2. Mathematics & Physics	3. Physics & Chemistry
4. Chemistry & Geology	5. Chemistry & Botany	6. Chemistry &Microbiology
7. Chemistry & Zoology	8. Chemistry & Entomology	

***** The major specialization is physics and the minor one is electronics.

Article (9)

Credit hour; Definition

One credit hour is equivalent to

1. A weekly one-hour lecture during the academic semester.

or 2. Two-hours exercises per week during the academic semester.

or 3. A practical or a training session of 2-3 hours per week during the academic semester.

Article (10)

Requirements for the B.Sc. Degree

Requirements for B. Sc. Degree in any single or double specialization are 138 credit hours distributed as follows:

1- University requirements are 10 credit hours (4 compulsory + 6 elective) for any specialization special or general as shown in tables 1 & 2.

2- Faculty requirements are 29 compulsory credit hours for any specialization single or double (table 3)

3- The requirements of the special B.Sc. degree (single specialization) are 78 credit hours: 57 compulsory & 21 elective. In addition to this, there are 21 credit hours of specialty supporting courses: 12 compulsory & 9 elective, as recorded in the learning program tables (single specialization).

4- The requirements of the General B.Sc. degree (double specialization) are 39 credit hours for each branch of specialization: 36 compulsory & 3 elective. In addition to this, there are 18 credit hours of specialty supporting courses: 12 compulsory & 6 elective.

5- A11 students should attend a six-week summer training period in one of the applied fields related to their specialization before graduation. No credit hours are specified for this training that starts only after accomplishing 90 credit hours.

6- Field work and scientific trips beneficial for their specialization may be included in some courses.

Article (11)

Registration

1- The vice Dean for Education and Student Affairs supervises the execution of the rules and procedure of registration. The registration department is responsible for preparing lists of students' names, the

study groups, time schedules, grouping students and directing them to their academic tutors and issuing detailed statements of the courses for every student. All academic data are to be recorded in special approved records.

2- An academic tutor is appointed to guide every student and help him/her in selecting subjects and determining the number of credit hours registered according to his/her conditions and abilities, as well as helping eliminate his/her problems.
3- The student is allowed to make early registration, i.e. before the beginning of the next semester.
4- Registration of a new course depends on passing its prerequisites, if any.
5- Students who were unable to register in due time for some reason could be accepted as compelling by the Dean, and are allowed to register during the 2nd week of the semester.
6- The students of double specialization have to choose one branch when registering the research or project article course.

Article (12)

Academic load

1- The maximum load for registration is 18 credit hours in each semester, while the minimum is 12. The maximum load may be raised to 21 credit hours only for students in graduation phase. The minimum load may be also lowered only with the approval of the Dean of the faculty.
2- If the student gets a semester average less than (2.0), he/she receives the first warning and registers a maximum of 12 credit hours in the next academic semester. If the student's average continues to be less than (2.0) in the next semester, the student receives the second warning and is allowed to register less than 9 credit hours to improve his/her average. If this recurs, the student receives his third and last warning. The next step is to dismiss the student completely from the faculty and to cancel his/her registration.
3- The faculty council may accept the registration of B.Sc. graduates of other practical faculties or equivalent with a cumulative average of minimum (2.0) after equating the courses with those already studied by the student with a maximum of 50% of the total credits required for graduation. The student who obtained a B.Sc. and wish to register in a different specialization, his/her cumulative average should include the common courses that have been studied before.

Article (13)

Drop, Add, Withdrawal and Transfer

1-Addition or omission

A student may add or omit one or two courses with the approval of the academic tutor before the end of the 2nd week of the semester under the condition that he/she is still committed to Article 12, items 1 and 2.

2-Withdrawal

Sticking to Article (12, items l and 2), a student may drop a course by the end of the 7th week of the semester as recommended by the academic tutor. The course will be included in the student's academic record with the grade 'withdraw' provided that the student does not exceed the allowed days of absence before withdrawal. Crucial cases of withdrawal may be presented to the student Affairs Committee 2 weeks after the assigned date and their decision is final.

3-Transference

Subject to the approval of the faculty council, a student may transfer from one specialization to another after equating the courses that he/she has accomplished.

Article (14)

Postponement and Quitting study

1- A student may postpone his/her study for not more than four academic semesters (continuously or separately) during his/her study in the faculty. He/she has to apply for the postponement by the end of the fourth week of the semester. The postponement is effective only after the approval of both the student Affairs Committee and the Faculty Council. If the student needs to postpone for a period more than four academic semesters, the matter altogether is referred to the University Council.

2- If the student quits studying in the faculty for a maximum period of two semesters for compelling reasons accepted by the Student Affairs Committee and the Faculty Council, he/she is given another chance for registration and resumes his/her study in the next semester. Moreover, this period is considered one of the chances of postponement available to the students. In the case of the disapproval of the committee, the student's registration is cancelled. The committee's decision is considered final after the approval of the Faculty Council.

Article (15)

Regular Attendance

1- The course professor has to record the names of the students who are present at the beginning of every lecture or a practical session in a list prepared by the Student Affairs Administration for every Course. This list should be handed on to his department at the end of the semester.

2- If the student exceeds 10% of absence from the course, the course professor has to inform the student Affairs Administration in order to send him/her the first written warning.

3- If the student exceeds 20% of absence from the course, the course professor has to inform the Student Affairs Administration in order to send him/her the second and final written warning.

4- If the student exceeds 25% of absence from the course, he/she is deprived of taking the final examination in this course and his/her estimation is (F). The Student affairs Administration should be informed to send a written notification to the student's legal guardian.

5- The Student Affairs Committee may consider the student's deprivation of taking the examination as withdrawal from the course if he/she presents an acceptable excuse. Its decision is final after the approval of the Faculty Council.

6- If the student wants to add a new course, his/her attendance is recorded starting with the date on which the course is added according to Article (13:1).

Article (16)

Assessment

Students' assessment is done according to the following steps:

1- Researches, field works, scientific trips and periodical short exams oral, written or applied held in the study rooms and recorded by the course professor.

2- The midterm exam should be between the 6th and the 9th weeks of the semester. The time of this exam should not exceed half the time allocated to the course and in the same time of the lecture.

3- The final practical exam is held in the last practical session.

4- The final written examination is held within the last two weeks of the semester according to a time-table prepared by the Student Affairs Administration and approval by the dean of the faculty. It is possible to change the date of the final exam with the approval of both the Student Affairs administration and the dean.

5- The time allowed for the final written exam for each course is equal to the course credit hours with maximum three hours.

6- If the course includes lectures and practical periods, both the midterm exam and the final exam should include theoretical and practical parts and the marks should be divided in proportion to the credit hours given to each part.

7- If the practical courses are separated from the theoretical courses then items 1, 2, and 3 of Article (16) should be applied.

8- It is possible for the student to see his/her answer sheet for the periodical, midterm and final exams after correction according to the basis and rules approval by faculty council and accepted by university council.

9- The honors degree is awarded to the student who gets a cumulative average of 3.00 or more in every academic semester on the condition that he/she has never failed any course during his/her study in the faculty or in the faculty from which he/she has been transferred.

Article (17)

Dividing marks

Each course is given 100 marks.

1- Courses have lecturers without practical periods are evaluated according to the following:

A) 20% of the total course marks for a term (Semester) assessments (including periodic short tests, homework and field trips).

B) 30% of the total course marks for midterm exam.

C) 50% of the total course marks for the final written comprehensive examination.

2- Courses have lectures and practical periods are evaluated according to the following:

A) 10% of the total course marks for term (Semester) assessments that include periodic short tests, homework and field trips.

B) 15 % of the total course marks for midterm exam.

C) 25 % of the total course marks for practical exam.

D) 50 % of the total course marks for final written comprehensive Exam.

3- Courses have only practical periods are evaluated according to the following:

A) 25 % of the total marks for term assessments.

B) 25 % of the total marks for midterm exam.

C) 50 % of the total marks for final exam.

2- Research and report course is evaluated according to the following:

A) 50 % of the total marks for various student activities

B) 50 % of the total marks for discussion session.

Article (18)

Numerical and symbolic counterparts of the marks and grades

1) The grading system is as follows

Grades	Symbols	Points	Mark
Excellent	A	4.0	90 – 100%
	A^-	3.7	85 - < 90%
Very Good	B^+	3.3	80 - < 85%
	B	3.0	75 - <80%
Good	B-	2.7	70 - < 75%
	C^+	2.3	65 - < 70%
Pass	C	2.0	63 - < 65%
	C^-	1.7	60 - < 63%
Exceptional pass	D^+	1.3	55 - < 60%
	D	1.0	50 - < 55%
Fail	F	0.0	< 50%
Absent	F	0.0	-

In case of recurring failure of a student in a course, it will be considered once in his/her cumulative average. However, all registration times for the course will remain on his/her academic record.

6- Semester average (Grade Point Average): is the average points gained by a student in a single semester approximated to two decimals only. It is calculated as follows:

$$\underset{(GPA)}{\textbf{Semester average}} = \frac{\text{Sum of semester course points multiplied by its credit hours}}{\text{Sum of semester credit hours of those courses}}$$

7- Cumulative Grade Point Average (CGPA) is the average points gained by a student during his/her previous study period and approximated to two decimals only. It is calculated as follows:

$$\textbf{CGPA} = \frac{\text{Sum of course points in all semesters multiplied by its credit hours}}{\text{Sum of credit hours of those semesters}}$$

8- The minimal grade for the cumulative average for graduation is C.

Article (19)

Faculty council can manage the rules that control the accepted number of students in each learning program according to the department availabilities.

Article (20)

The University Council may add, omit, modify or cover any part of this regulation according to the suggestion of the Faculty Council and department councils in order to develop the educational process (without any objection with the executive regulation of the universities organization law).

Article (21)

Anything which is not mentioned in this regulation should be referred to the executive regulation of the Universities Organization Law.

Coding and Numbering System

Lecher	Meaning	Lecher	Meaning
M	Mathematics	EN	Faculty of Engineering
P	Physics	L	Faculty of Law
C	Chemistry	ED	Faculty of Education
G	Geology	V	Faculty of veterinary
Z	Zoology	MED	Faculty of Medicine
B	Botany	PH	Faculty of Pharmacy
MC	Computer Sciences	A	Faculty of Agricultures
MS	Statistics	AR	Faculty of Art
SED	Faculty of Special Education	E	Entomology
UR	University Requirements	FR	Faculty Requirements

Numbering System:

First digit from the right

- The odd number means that the courses are offered in the first semester.
- The even number means that the courses are offered in the second semester.
- 0 and 5 numbers mean that the courses are offered in the two semesters.

Second digit from the right

- Refers to the special branch in the department.

Third digit from the right:

- Refers to the level of the course.
  Example: (P353)
- Number 3 means that the course is offered in the First semester.
- Number 5 means that the course is related to the solid state physics.
- Number 3 means that the course level is three.

Significance of the second digit in the numbering System

A) Mathematics Department

Branches	Code of second digit
Mathematical Analysis	010
Pure mathematics	020
Applied mathematics	030
Statistics	040
Computer Since	050
Computer Since	060

B) Physics Department

Course	Code of second digit
General and theoretical physics	010
Heat, thermodynamics and Law temp physics	020
Atomic and plasma physics	030
Nuclear and radiation physics	040
Solid State Physics	050
Electricity and electronics	060
Physical optics, Laser and optical fibers	040
Environmental and astrophysics	080
Special topics	090

C) Chemistry Department

Course	Code of second digit
Organic chemistry	010
Inorganic chemistry	020
Physical chemistry	030
Analytical chemistry	040
Chemistry for non chemistry students	050

D) Geology Department

Course	Code of second digit
General Geology	000
Stratigraphy & Paleontology	010
Sedimentology & Sedimentation	020
Petrology, Mineralogy, and Geochemistry	030
Structure, Photogeology, and Remote sensing	040
Geophysics	050
Hydrogeology & Petroleum Geology	060

E) Botany Department

Course	Code of second digit
General Botany	010
Plant morphology and anatomy	020
Plant taxonomy	030
Ecology	040
Plant physiology	050
Mycology	060
Bacteriology and phycology(Algae)	070
Virology	080
General microbiology	090

F) Zoology Department

Course	Code of second digit
Cytology, Histology and Physiology courses.	010
Invertebrate and Ecology courses.	020
Vertebrate Anatomy and Embryology courses.	030
Entomology courses	040
Entomology courses	050
Entomology courses	060
Fish Biology and Fisheries courses.	070
Fish Biology and Fisheries courses.	080
Fish Biology and Fisheries courses.	090

Study Programs

The graduation requirements

The minimum total credit hours required for the conferring of the B.Sc. degree is 138
A detailed distribution of the 138 credit hours is shown below:

First: Single Major

Classifications	Credit hours		
	Compulsory	Elective	Total
University requirements	4	6	10
Faculty requirements	29	-	29
Specialization requirements	57	21	78
Supporting courses	12	9	21
Total	102	36	138

Second: Double Major

Classifications		Credit hours		
		Compulsory	Elective	Total
University requirements		4	6	10
Faculty requirements		29	-	29
Specialization requirements	First specialization	36	3	39
	Second specialization	36	3	39
Supporting courses		12	9	21
Total		117	21	138

University Requirements

Table (1): Compulsory University Requirements (4 credit hours)

Code	Course Title	Pre-requisites	Hours/Week		
			L	T./P.	Credit
015UR	English Language (1)	-	2	-	2
020UR	English Language (2)	015UR	2	-	2
050UR	Human Rights	-	2	-	-

Table (2): Elective University requirements (6 credit hours)

Code	Course Title	Pre-requisites	Hours/Week		
			L	T./P.	Credit
011FR	Management	-	2	-	2
012FR	History of Herbal Medicine	-	2	-	2
013FR	Scientific Thinking	-	2	-	2
014FR	Professional Ethics	-	2	-	2
015FR	Arabic Language	-	2	-	2
016FR	Principles of Labor Low	-	2	-	2
017FR	Music	-	2	-	2
018FR	Marketing	-	2	-	2
019FR	Healthy Feeding	-	2	-	2

Faculty Requirement

Compulsory Faculty Requirements (29 credit hours)

Code	Course Title	Pre-requisites	Hours/Week		
			Lect.	T./P.	Credits
M100	Mathematics (1)	-	2	2	3
M105	Mathematics (2)	M100	2	2	3
P100	Physics (1)	-	2	2	3
P105	Physics (2)	P100	2	2	3
C100	Chemistry (1)	-	2	3	3
C105	Chemistry (2)	C100	2	3	3
G100	Principles of Geology	-	2	2	3
Z100	General Zoology	-	2	2	3
B100	General Botany	-	2	2	3
MC100	Computer (I)	-	1	2	2

1-Courses to be offered for the B.Sc. Degree in Mathematics

A. Compulsory Courses (57 credit hours)

Code	Course Title	Pre-requisite	Hours/Week		
			Lect.	T./P.	Credits
M211	Advanced Calculus	M105	2	2	3
M212	Differential Equations (1)	M211	2	2	3
M221	Linear Algebra and Geometry	M105	2	2	3
M223	Discrete Mathematics	M105	2	--	2
M231	Newtonian Mechanics	M105	2	2	3
M232	Analytical Mechanics	M231	2	2	3
MS242	Probability (1)	M211	2	2	3
M312	Real Analysis (1)	M211	3	--	3
M313	Differential Equations (2)	M212	3	--	3
M321	Groups Theory	M223	2	--	2
M322	Theory of Rings and Fields	M321	2	--	2
M323	Numerical Analysis (1)	M212	3	--	3
M331	Mathematical Foundations of Quantum Theory & Statistical Mechanics (1)	M232	2	2	3
M332	Mathematical Foundations of Electromagnetic Theory and Special Theory of Relativity(1)	M231	2	2	3
M334	Mathematical Methods	M212	2	--	2
M411	Function Analysis	M312	2	--	2
M412	Complex Variables	M312	3	--	3
M421	Topology and Differential Geometry (1)	M312	2	2	3
M431	Hydrodynamic & Elasticity (1)	M232	2	2	3
MS442	Mathematical Statistics	MS242	3	--	3
M400	Research project/Article	*	--	--	2

*** Accomplishing 100 credit hours**

Cont.1-Courses to be offered for the B.Sc. Degree in Mathematics

B. Elective Courses **(21 credit hours)**

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
M314	Dynamical Systems	M313	3	--	3
M315	Special Topics in Mathematics	Dept. Concept	3	--	3
M317	Numbers Theory	M223	3	--	3
M319	Tensors	M211	3	--	3
M326	Operation Research (1)	M211+M221	3	--	3
M335	Special Topics in Applied Mathematics	Dept. Concept	3	--	3
M413	Real Analysis (2)	M312	3	--	3
M 414	Partial Differential	M313	3	--	3
M417	Measure Theory and Integration	M312	3	--	3
M422	Topology and Differential Geometry (2)	M421	2	2	3
M424	Numerical Analysis (2)	M323	3	--	3
M427	Special Topics in Mathematics	Dept. Concept	3	--	3
M432	Hydrodynamic & Elasticity (2)	M431	2	2	3
M433	Mathematical Foundations of Quantum Theory & Statistical Mechanics(2)	M331	2	2	3
M434	Mathematical Modeling	M334	3	--	3
M436	Special Topics in Applied Mathematics	Dept. Concept	3	--	3
M437	Mathematical Foundations of Electromagnetic Theory and Special Theory of Relativity (2)	M332	2	2	3

Cont. 1-Courses to be offered for the B.Sc. Degree in Mathematics

C. Supporting compulsory courses (12 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
P225	Introduction to Modern physics	P105	2	2	3
P226	Electricity and AC Current	P105	2	3	3
MC251	Object- Oriented Programming	MC100	2	2	3
MC252	Data structure	MC251	2	2	3

D. Supporting elective courses (9 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
MS346	Stochastic Processes and applications	MS242	3	--	3
MC356	Introduction to Scientific Computing	MC252&M323	2	2	3
MC469	Computer Applications in Mathematics	MC252+M323	2	2	3
P350	Introduction to Solid state physics	P225	2	3	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

2-Courses to be offered for the B.Sc. Degree in Statistics

A. Compulsory Courses (57 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
M211	Advanced Calculus	M105	2	2	3
M212	Differential Equations (1)	M211	2	2	3
M221	Linear Algebra and Geometry	M105	2	2	3
M223	Discrete Mathematics	M105	2	--	2
M231	Newtonian Mechanics	M105	2	2	3
M232	Analytical Mechanics	M231	2	2	3
MS242	Probability (1)	M211	2	2	3
M312	Real Analysis (1)	M211	3	--	3
M323	Numerical Analysis (1)	M212	3	--	3
M326	Operation Research	M211, M221	3	--	3
M334	Mathematical Methods	M212	2	--	2
MS341	Statistical Inference (1)	MS242	3	--	3
MS342	Statistical Inference (2)	MS341	3	--	3
MS343	Sampling Theory	MS242	2	--	2
MS347	Probability (2)	MS242	3	--	3
M421	Topology and Differential Geometry (1)	M312	2	2	3
M424	Numerical Analysis (2)	M323	3	--	3
MS441	Statistical Distributions	MS347	2	--	2
MS443	Reliability Theory	MS347	2	--	2
MS444	Order Statistics	MS441	3	--	3
MS400	Research project/Article	*	--	--	2

*** Accomplishing 100 credit hours**

Cont. 2-Courses to be offered for the B.Sc. Degree in Statistics

B. Elective Courses (21 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
M313	Differential Equations (2)	M212	3	--	3
M314	Dynamical Systems	M313	3	--	3
M317	Numbers Theory	M223	3	--	3
M335	Special topics in Applied Mathematics	Dept. Concept	3	--	3
MS344	Analysis of Regression and Correlation Models	MS242	3	--	3
MS346	Stochastic Processes and its applications	MS242	3	--	3
MS348	Statistical Quality Control	MS242	3	--	3
MS349	Time Series Analysis	MS242	3	--	3
M413	Real Analysis (2)	M312	3	--	3
M414	Partial Differential	M313	3	--	3
M422	Topology and Differential Geometry (2)	M421	2	2	3
M427	Selected topics in Mathematics	Department Consent	3	--	3
M434	Mathematical Modeling	M334	3	--	3
MS440	Statistical Computations	MS347	3	--	3
MS446	Nonparametric Statistics	MS347	3	--	3
MS447	Experimental Design Models	MS347	3	--	3
MS448	Multivariate Analysis	MS347	3	--	3
MS449	Queuing Theory	MS347	3	--	3

Cont. 2-Courses to be offered for the B.Sc. Degree in Statistics

C. Supporting compulsory courses (12 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
P225	Introduction to Modern Physics	P105	2	2	3
P226	Electricity and AC current	P105	2	3	3
MC251	Object-Oriented Programming	MC100	2	2	3
MC252	Data structure	MC251	2	2	3

D. Supporting elective courses (9 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
MC356	Introduction to Scientific Computing (1)	MC252, M323	2	2	3
MC368	Computer applications in statistics	MC252+MS242	2	2	3
M426	Operation Research (2)	M326	3	--	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

3- Courses to be offered for the B.Sc. Degree in Computer Science

A. compulsory Courses (57 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
M211	Advanced Calculus	M105	2	2	3
M212	Differential Equations (1)	M211	2	2	3
M221	Linear Algebra and Geometry	M105	2	2	3
M223	Discrete Mathematics	M105	2	--	2
MS242	Probability(1)	M211	2	2	3
MC251	Object-Oriented Programming	MC105	2	2	3
MC252	Data Structures	MC251	2	2	3
M323	Numerical Analysis (1)	M212	3	—	3
M326	Operations Research (1)	M211, M221	3	—	3
MC351	Operating System	MC251	2	2	3
MC352	Artificial Intelligence	M223 MC252	2	2	3
MC353	Algorithms	M223 MC252	2	2	3
MC354	Computer Networks	MC351	2	2	3
MC356	Introduction to Scientific Computations	M323 MC252	2	2	3
MC357	Databases	MC252	2	2	3
MC451	Scientific Computations (1)	MC356	2	2	3
MC452	Distributed Computing	MC354	2	—	2
MC453	Computer Security	MC354	2	—	2
MC458	Compilers	MC457	2	—	2
MC457	Theory of Computation	M223 MC353	2	—	2
MC400	Research project/Article	*	-	—	2

*** Accomplishing 100 credit hours**

Cont. 3-Courses to be offered for the B.Sc. Degree in Computer Science

B. Elective Courses (21 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
MC355	Special Topics in Computer Science	Dept. Concept	2	2	3
MC361	Logic Circuits	M100	2	2	3
MC362	System Simulation	MC252	2	2	3
MC363	Systems Evaluation	MC362	2	2	3
MC364	Programming Languages Theory	MC252	2	2	3
MC366	Image Processing	MC353	2	2	3
MC367	Formal Language and Automata	M353	2	2	3
M426	Operations Research (2)	M326	3	-	3
MC455	Special Topics in Computer Science	Dept. Concept	2	2	3
MC461	Computer Graphics	MC351	2	2	3
MC462	Scientific Computations (2)	MC451	2	2	3
MC463	Data Communications	MC354	2	2	3
MC464	Data Mining	MC352	2	2	3
MC466	Cryptography	MC354	2	2	3
MC467	Software Design and Engineering	MC351	2	2	3

Cont. 3-Courses to be offered for the B.Sc. Degree in Computer Science

C. Supporting compulsory courses (12 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
M231	Newtonian Mechanics	M105	2	2	3
M232	Analytical Mechanics	M231	2	2	3
P225	Introduction to Modern physics	P105	2	2	3
P226	Electricity and AC current	P105	2	3	3

D. Supporting elective courses (9 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T./P.	Credits
421ED	Computer Architecture	MC361	2	2	3
325EE	Microprocessor	MC100	2	2	3
P350	Introduction to Solid state physics	P225	2	-/3	3
P451	Physics of Semiconductors and thin Films and its applications	P350	3	--	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

4- Courses to be offered for the B.Sc. Degree in Physics

A) Compulsory Courses (57 Credit hours)

Code	The Course Title	Pre-requisites	Hours/week		
			Lect.	T/P	Credits
P212	Vibrations and Waves	M105, P105	3	-	3
P215	Modern Physics	P105	3	-	3
P223	Thermodynamics	P100	3	-	3
P256	Physics of Metals, Alloys and Ceramics	P105	3	-	3
P261	Electricity and Magnetism	P105	3	-	3
P265**	Electricity and Magnetism	P261	-	3	1
P271	Physical Optics and Optical	P105	3	-	3
P275***	Thermodynamics and Physical Optics Lab	P271, P223	-	3	1
P315	Modern Physics Lab	P215	-	3	1
P311	Quantum mechanics (1)	P215, M211	3	-	3
P312	Electromagnetic Theory and Electrodynamics	P261 , M211	3	-	3
P313	Statistical Physics	P223	3	-	3
P332	Plasma Physics and its	P215	3	-	3
P342	Nuclear Physics(1)	P215	3	-	3
P345**	Nuclear Physics Lab	P342	-	3	1
P353	Solid State Physics (1)	P215	3	-	3
P355**	Solid State Physics Lab	P353	-	3	1
P361	Electronics (1)	P261	3	-	3
P365**	Electronics Lab (1)	P361	-	3	1
P432	Atomic and Molecular	P215	3	-	3
P451	Physics of Semiconductors and Thin Films and its Applications	P353	3	-	3
P455**	Semiconductors Physics Lab	P451	-	3	1
P472	Laser Physics and its Applications	P271	3	-	3
P400	Research Project/Article	*	-	-	2

*** Accomplishing 100 Credit hours**

Cont. 4- Courses to be offered for the B.Sc. Degree in Physics

B) Elective Courses (21 Credit hours)

Code	Course Title	Prerequisites	Hours/week		
			Lect.	T/P	Credits
P316	Methods of Mathematical Physics	P105, M211	3	-	3
P354	Crystal growth and Physical properties of crystal	P215	3	-	3
P381	Astrophysics	P105	3	-	3
P383	Environmental Physics	P105	3	-	3
P411	Quantum mechanics II	P311	3	-	3
P414	Modeling of Physical Systems	P316	3	-	3
P422	Low Temperature Physics and Superconductivity	P223	3	-	3
P444	Radiation Physics, Radiation Pollution and protection of Radiation	P342	3	-	3
P453	Magnetic Resonance & Mossbauer	P353	3	-	3
P457	Amorphous Materials and Glasses	P353	3	-	3
P458	Physics of Nano-materials and its Applications	P256	3	-	3
P462	Physical Measurements using Computers	M105, MC105, P105	3	-	3
P491	Special Topics in Physics (1)	Dep. Consent	3	-	3
P492	Special Topics in Physics (2)	Dep. Consent	3	-	3

Cont. 4- Courses to be offered for the B.Sc. Degree in Physics

C. Supporting Compulsory Courses (12 Credit hours)

Code	The Course Title	Pre-Requisites	Hours/Week		
			Lect.	T/P	Credits
M 211	Advanced Calculus	M105	2	2	3
M212	Differential Equations (1)	M211	2	2	3
M221	Linear Algebra and Geometry	M105	2	2	3
MC251	Object-Oriented Programming	MC105	2	2	3

D. Supporting Elective Courses (9 Credit hours)

Code	Course Title	Pre-requisites	Hours/week		
			Lect.	E/P	Credits
M318	**Partial Differential and Special Functions**	**M212**	**3**	**-**	**3**
M319	**Tensors**	**M211**	**3**	**-**	**3**
M323	**Numerical Analysis I**	**M212**	**3**	**-**	**3**
MC361	**Logic Circuits**	**MC100**	**2**	**2**	**3**
M419	**Mathematical Analysis**	**M 211**	**2**	**2**	**3**
MC300	**Mathematical and Statistical Packages**	**MC100**	**2**	**2**	**3**

5-Courses to be offered for the B.Sc. Degree in Chemistry

A. Compulsory Courses (57 credit hours)

Code	Course title	Pre-requisites	Hours/Week		
			Lect.	T \ P	Credits
C210	Organic Chemistry I	C 105	3	3	4
C212	Organic Chemistry II	C 210	3	3	4
C220	Inorganic chemistry 1	C 100	2	-	2
C230	Physical chemistry 1	C 100	3	-	3
C232	Physical chemistry 2	C 230	3	-	3
C240	Introductory quantitative analysis	C 105	2	3	3
C311	Stereochemistry and spectroscopy	C 212	3	3	4
C312	Biochemistry and Natural products	C 311	3	3	4
C320	Inorganic Chemistry Lab	C 321**	-	3	1
C321	Inorganic chemistry II	C 220	3	-	3
C324	Inorganic chemistry III	C 321	3	-	3
C331	Physical chemistry Lab I	C 230**	-	3	1
C332	Physical chemistry III	C 232	3	-	3
C342	Analytical Chemistry I	C 240	2	3	3
C400	Research Project\Article	*	-	-	2
C411	Petroleum Chemistry and Chromatography	C 212	3	3	4
C412	Applied organic chemistry	C 212	2	3	3
C431	Physical chemistry Lab. II	C 232+ C 331	-	3	1
C432	Surface Chemistry and Electrochemistry	C 232	3	-	3
C441	Analytical Chemistry II	C 342	2	3	3

*** Accomplishing 100 Credit hours**
****Concurrent**

Cont. 5-Courses to be offered for the B.Sc. Degree in Chemistry

B. Elective Courses (21 credit hours)

Code	Course title	Pre-requisites	Hours/Week		
			Lect.	T \ P	Credits
C214	Environmental and Green Chemistry	C212	3	-	3
C234	Computational Chemistry	C332	3	-	3
C313	Photochemistry and Reactive Intermediates	C212	3	-	3
C314	Advanced Organic Synthesis	C311	3	-	3
C333	Nuclear and Radiation Chemistry	C232	3	-	3
C334	Corrosion Chemistry	C332	3	-	3
C343	Environmental Analysis	C105	3	-	3
C414	Special topics in Organic Chemistry	Department Consent	3	-	3
C422	Inorganic chemistry IV	C321	3	-	3
C423	Special topics in Inorganic chemistry	Department Consent	3	-	3
C434	Applied Catalysis	C 332	2	3	3
C437	Selected topics in Physical Chemistry	Department Consent	3	-	3
C444	Selected topics in Analytical Chemistry	Department Consent	3	-	3
C453	Industrial Chemistry	C220	3	-	3

Cont. 5-Courses to be offered for the B.Sc. Degree in Chemistry

C. Supporting Compulsory Courses (12 credits hours)

Code	Course title	Pre-requisites	Hours/Week		
			Lect.	T \ P	Credits
P225	Introduction to Modern Physics	P105	2	2	3
MS241	Biostatistics	M105	3	-	3
M214	Differential Equations for non-Mathematics students	M105	2	2	3
G213	Crystallography and Optical Mineralogy	G100	2	3	3

D. Supporting elective Courses (9 credit hours)

Code	Course title	Pre-requisites	Hours/Week		
			Lect.	T \ P	Credits
Z318	**Cell and Molecular Biology**	**Z100**	2	2	3
P323	**Biophysics**	**P105**	3	-	3
B291	**General Microbiology**	**B100**	2	3	3
P350	**Introduction to solid state physics**	**P225**	2	3	3
MC300	**Mathematical and Statistical Packages**	**MC100**	2	2	3

6- Courses to be offered for the B.Sc. Degree in Geology

A. Compulsory Courses (57 Credit Hours)

Code	Course Title	Pre-requisites	Hours/week		
			Lect.	P/T	Credits
G210	Stratigraphy	G100	2	2	3
G215	Invertebrate Paleontology	G100	2	2	3
G230	Rock Forming Minerals	G100	2	2	3
G233	Crystallography	G100	1	3	2
G235	Mineral Optics	G100	2	2	3
G250	Principles of Geophysics	G100	1	2	2
G306	Field Geology	G230	1	3	2
G315	Micro-Paleontology and Historical Geology	G215	3	3	4
G327	Sedimentology and Depositional Systems	G230	2	3	3
G333	Igneous Petrology	G230	2	2	3
G336	Metamorphic Petrology	G230	2	2	3
G340	Rock Mechanics & Structural Geology	G100	3	2	4
G400	Research Project	*	--	--	2
G405	Field Training	G306	-	3	1
G415	Geology of Egypt	G210	3	3	4
G420	Sequence Stratigraphy and Basin Analysis	G327	2	3	3
G431	Ore Microscopy &Ore Petrology	G230	2	3	3
G433	Geochemistry	G230	2	2	3
G434	Economic Geology	G333, G327, G336	2	2	3
G460	Hydrogeology I and Petroleum Geology I	G210	2	3	3

***Accomplishing 100 Credit hours**

Cont. 6-Courses to be offered for the B.Sc. Degree in Geology

B. Elective Courses **(21 Credit hours)**

Code	Course Title	Pre-requisite	Hours / week		
			Lect.	P/T	Credits
G201	Environmental Geology and Geomorphology	G100	2	2	3
G216	Vertebrate Paleontology & Origin of Species	G215	2	2	3
G240	Geographic Information Systems (GIS)	MC100	2	2	3
G305	Special course in Geology	Department consent	2	2	3
G319	Chrono- and Chemo-stratigraphy	G210 , G 230	2	2	3
G323	Marine Geology and Diagenesis	G230	2	3	3
G401	Geostatistics	G250	2	2	3
G407	Engineering and Mining Geology	G230	2	2	3
G409	Subsurface Geology	G250; G340	2	2	3
G411	Palynology and Trace Fossils	G315	2	3	3
G414	Paleoecology and Biostratigraphy	G215	2	2	3
G421	Applied Sedimentology and Clay mineralogy	G327	2	2	3
G430	Geotectonics and Isotope Geology	G230	2	2	3
G435	Mineral prospection and Industrial Minerals and Rocks	G230	2	2	3
G436	Introduction to Medical Geology and Volcanology	G230	2	2	3
G444	Well logging & Structural Analysis	G340	2	2	3
G445	Photogeology and Remote Sensing	G340	2	3	3

Cont. 6-Courses to be offered for the B.Sc. Degree in Geology

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Pre-requisite	Hours/week		
			Lect.	P/T	Credits
EN200	Surveying	M100	2	2	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3
MS241	Biostatistics	M105	3	-	3
P225	Introduction to Modern Physics	P105	2	2	3

D. Supporting Elective Courses (9 Credit Hours)

Code	Course Title	Pre-requisite	Hours / week		
			Lect.	P/T	Credits
P352	Diffraction of waves and its applications	P225	3	-	3
C211	Organic Chemistry for non chemistry students	C105	2	3	3
C465	Analytical Chemistry for Geology students	C105	2	3	3
Z418	Introduction to Embryology and Evolution	Z100	2	3	3
Z318	Cell & Molecular Biology	Z100	2	2	3
EN420	Hydrology	G340	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

7- Courses to be offered for the B.Sc. Degree in Geophysics

A. Compulsory Courses (57 Credit Hours)

Code	Course Title	Pre-requisites	Hours/week		
			Lect.	P/T	Credits
G210	Stratigraphy	G100	2	2	3
G230	Rock Forming Minerals	G100	2	2	3
G233	Crystallography	G100	1	3	2
G235	Mineral Optics	G100	2	2	3
G250	Principles of Geophysics	G100	1	2	2
G306	Field Geology	G100,G210	1	3	2
G324	Principles of Petrology	G230	3	3	4
G327	Sedimentology and Depositional Systems	G230	2	3	3
G340	Rock Mechanics & Structural Geology	G100	3	2	4
G350	Earthquake Seismology and Seismic prospection	G250	2	3	3
G351	Gravity and Magnetic prospection	G250	2	3	3
G358	Electrical prospection	G250	1	3	2
G400	Research Project	*	--	--	2
G405	Field Training	G306	-	3	1
G415	Geology of Egypt	G210	3	3	4
G420	Sequence Stratigraphy and Basin Analysis	G327	2	3	3
G434	Economic Geology	G230	2	2	3
G452	Geothermics and Radiometrics Techniques	G250	1	2	2
G456	Statistical methods in Geophysics	MC100	1	3	2
G459	Petrophysics and Well Logging	G250, G327	2	2	3
G460	Hydrogeology I and Petroleum Geology I	G210	2	3	3

***Accomplishing 100 Credit hours**

Cont.7-Courses to be offered for the B.Sc. Degree in Geophysics

B. Elective Courses (27 Credit hours)

Code	Course title	Pre-requisites	Hours/week		
			Lect.	P/T	Credits
G201	Environmental Geology and Geomorphology	G100	2	2	3
G215	Invertebrate Paleontology	G100	2	2	3
G240	Geographic Information Systems(GIS)	MC105	2	2	3
G305	special course in Geology	Department consent	2	2	3
G313	Historical Geology and Origin of Species	G210	2	2	3
G353	Environmental Geophysics	G250	2	2	3
G407	Engineering and Mining Geology	G230	2	2	3
G409	Subsurface Geology	G250,G340	2	2	3
G421	Applied Sedimentology and Clay mineralogy	G230	2	2	3
G430	Geotectonics and Isotope Geology	G230	2	2	3
G435	Mineral prospection and Industrial Minerals and Rocks	G230	2	2	3
G436	Introduction to Medical Geology and Valcanology	G230	2	2	3
G445	Photogeology and Remote Sensing	G340	2	2	3
G450	Selected course in Geophysics	Department consent	2	2	3
G451	Engineering Geophysics	G250	2	2	3
G453	Georadar and Paleomagnetism	G250	2	2	3
G458	Geoarchaeology	G250	2	2	3
G462	Hydrogeology II and Petroleum Geology II	G210	2	3	3

Cont. 7-Courses to be offered for the B.Sc. Degree in Geophysics

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Pre-requisites	Hours / week		
			Lect.	P/T	Credits
EN200	Plane Surveying	M100	2	2	3
MS241	Biostatistics	M105	3	-	3
P225	Introduction to Modern Physics	P105	2	2	3
P212	Vibrations & Waves	P105, M105	3	-	3

D. Supporting Elective Courses (9 Credit hours)

Code	**Course Title**	**Prerequisite**	**Hours/Week**		
			Lect.	**P/T**	**Credits**
P344	Radiation Physics	P225	3	-	3
P350	Introduction to Solid State Physics	P225	2	3/-	3
P352	Diffraction of waves and its applications	P225	3	-	3
M214	Differential equations for non- mathematical students)	M105	2	2	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3
EN320	Geodetic Surveying and its applications	EN200	2	2	3
EN420	Hydrology	G100	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

8-Courses to be offered for the B.Sc. Degree of Petroleum Geology

A. Compulsory courses (57 credit hours)

Code	Courses Title	Pre-request	Hours/week		
			Lect.	P/T	Credits
G210	Stratigraphy	G100	2	2	3
G215	Invertebrate Palaeontology	G100	2	2	3
G230	Rock forming minerals	G100	2	2	3
G233	Crystallography	G100	1	3	2
G235	Mineral optics	G100	2	2	3
G250	Principles of Geophysics	G100	1	2	2
G306	Field Geology	G230	1	3	2
G318	Microphalaeontology and Palynology	G210 G215	3	3	4
G327	Sedimentology & Depositional Systems	G230	2	3	3
G331	Igneous and Metamorphic Petrology	G230	2	3	3
G340	Rock Mechanics and Structural Geology	G100	3	2	4
G360	Introduction to Petroleum Geology	G327	2	3	3
G400	Research Project		-	-	2
G405	Field Training	G306	-	3	1
G415	Geology of Egypt	G210	3	3	4
G420	Sequence Stratigeaphy & Basin Analysis	G327	2	3	3
G437	Organic Geochemistry	G318 G360	2	2	3
G455	Petrophysics & Exploration Geophysics	G230	2	2	3
G457	Borehole Geophysics	G360	2	3	3
G461	Petroleum Geology	G360	2	3	3

Cont.8-Courses to be offered for the B.Sc. Degree in Petroleum Geology

B. Elective Courses (27 Credit hours)

Code	Courses Title	Pre-request	Hours/week		
			Lect.	P/T	Credits
G201	Environmental Geology & Geomorphology	G100	2	2	3
G240	Geographic Information Systems (GIS)	MC100	2	2	3
G305	Special course in Geology	department	2	2	3
G319	Chrono- and Chemo-stratigraphy	G210, G230	2	2	3
G323	Marine Geology and Diagenesis	G230	2	3	3
G353	Environmental Geophysics	G250	2	2	3
G362	Hydrogeology and Hydrogeochemistry	G210, G230	2	2	3
G401	Geostatistics	G250	2	2	3
G402	Earth's Dynamic Systems	G340	2	2	3
G407	Engineering and Mining Geology	G230	2	2	3
G409	Subsurface Geology	G250 G340	2	2	3
G414	Palaeoecology and Biostratigraphy	G215	2	2	3
G421	Applied Sedimentology & Clay mineralogy	G327	2	2	3
G430	Geotectonics and Isotope Geology	G230	2	2	3
G445	Photogeology and Remote Sensing	G340	2	2	3
G463	Special course in Petroleum Geology	department consent	2	2	3
G464	Petroleum Geology of Egypt	G360	2	2	3
G465	Reservoir Evaluation and Petroleum Production	G360	2	2	3

Cont.8-Courses to be offered for the B.Sc. Degree in Petroleum Geology

C. Supporting Compulsory Courses (12 credit hours)

Code	Courses Title	Pre-request	Hours/week		
			Lect.	P/T	Credits
EN200	Plane Surveying	M100	2	2	3
P225	Introduction to Modern Physics	M105	2	2	3
MS241	Biostatics	M105	3	-	3
C451	Engineering Geophysics	C105	2	3	3

D. Supporting Elective Courses (9 Credit hours)

Code	Courses Title	Pre-request	Hours/week		
			Lect.	P/T	Credits
C211	Organic Chemistry for Non-Chemistry Students	C105	2	3	3
M214	Differential Equations for non-mathematical students	M105	2	2	3
P352	Diffraction of waves and its Applications	P225	3	-	3
C465	Analytical Chemistry for Geology Students	C105	2	3	3
EN320	Geodetic Surveying & its applications	EN200	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

9- Courses to be offered for the B.Sc. Degree in Botany

A. Compulsory courses (57 credit hours)

Code	Courses Title	Pre-requests	Hours / Week		
			Lect.	P/T	Credits
B211	Economic botany	B100	1	-	1
B212	Molecular biology	B100	2	-	2
B221	Plant morphology and anatomy	B100	2	2	3
B232	Taxonomy of flowering plants	B100	2	2	3
B241	Plant ecology	B100	2	2	3
B251	Plant physiology	B100	2	2	3
B252	Enzymes and plant hormones	B251	3	2	4
B273	Phycology	B100	2	2	3
B291	General microbiology	B100	2	3	3
B312	Bryophyta, Pteridophyta and Gymnosperm	B100	2	2	3
B321	Advanced plant anatomy	B221	2	2	3
B323	Plant cytology	B100	1	2	2
B332	Advanced plant taxonomy	B221	2	2	3
B333	Medicinal plants	B232	2	2	3
B334	Flora of Egypt**	B232	2	2	3
B341	Phytogeography	B241	2	-	2
B342	Plant sociology	B241	2	2	3
B343	Water relations	B241	2	-	2
B351	Mineral nutrition	B251	2	2	3
B352	Plant biochemistry	B251	2	2	3
B400	Research project or article	*	-	-	2

*** Accomplishing 100 Credit hours**
**** Excursion**

Cont. 9- Courses to be offered for the B.Sc. Degree in Botany

B. Elective courses (21 credit hours)

Code	Courses Title	Prerequisites	Hours/Week		
			Lect.	P/T	Credits
B261	Mycology	B100	2	2	3
B271	Bacteriology	B100	2	2	3
B281	Virology	B100	2	2	3
B374	Ecology of Algae	B273	2	2	3
B397	Plant pathogenic microorganisms	B261,B271	2	2	3
B411	Seed biology	B241	2	2	3
B431	Palynlogy	B232	2	2	3
B442	Ecology of drought and halophytic plants	B241	2	2	3
B451	Stress physiology	B251	2	2	3
B452	Secondary plant metabolism	B251	2	2	3
B453	Biotechnical analysis	B251	2	2	3
B454	Tissue culture	B251	2	2	3

C. Supporting compulsory courses (12 credit hours)

Code	Courses Title	Prerequisites	Hours / Week		
			Lect.	P/T	Credits
C250	Physical and inorganic chemistry	C100	2	3	3
C211	organic chemistry for non chemistry student	C105	2	3	3
P323	Biophysics	P105	3	0	3
A215	Genetics	B100	2	2	3

D. Supporting elective courses (9 credit hours)

Code	Courses Title	Prerequisites	Hours/Week		
			Lect.	P/T	Credits
Z240	General Entomology	Z100	2	2	3
G219	Plant fossils	G100	2	2	3
PH216	Botanical drugs	B100	2	2	3
A316	Design of experiments	B100	2	2	3
C460	Analytical Chemistry for Biology Students	C105	2	3	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

10- Courses to be offered for the B.Sc. Degree of Microbiology

A. Compulsory courses (57 credit hours)

Code	Courses Title	Pre-request	Hours/Week		
			Lect.	P/T	Credits
B212	Molecular biology	B100	2	-	2
B221	Plant morphology and anatomy	B100	2	2	3
B251	Plant physiology	B100	2	2	3
B262	Systematic mycology (1)	B100	2	2	3
B271	Bacteriology	B100	2	2	3
B273	Phycology	B100	2	2	3
B281	Virology	B100	2	2	3
B323	Plant cytology	B100	1	2	2
B361	Biology of aquatic Fungi	B262	2	2	3
B362	Systematic mycology (2)	B262	2	2	3
B363	Physiology of Fungi	B262	2	2	3
B364	Plant pathogenic Fungi	B262	2	2	3
B366	Host-parasite relationships	B262	1	-	1
B374	Ecology of Algae	B273	2	2	3
B381	Advanced Virology	B281	1	2	2
B392	Microbial metabolism	B271/B262	2	2	3
B393	Microbial toxins	B271/B262	2	2	3
B394	Microbial enzymes	B271/B262	2	2	3
B396	Industrial microbiology**	B363	2	2	3
B397	Plant pathogenic Microorganisms	B271/B362	2	2	3
B400	Research project or article	*	-	-	2

*** Accomplishing 100 Credit hours**
**** Excursion**

Cont.10-Courses to be offered for the B.Sc. Degree in Microbiology

B. Elective courses (21 credit hours)

Code	Courses Title	Pre-request	Hours/Week		
			Lect.	P/T	Credits
B232	Taxonomy of flowering plants	B100	2	2	3
B241	Plant ecology	B100	2	2	3
B453	Biotechnical analysis	B251	2	2	3
B472	Actinomycetes	B271	2	2	3
B491	Soil microbiology	B271/B262	2	2	3
B494	Microbial ecology	B100	2	2	3
B496	Symbioses microbiology	B271/B262	2	2	3
B497	Microbial secondary metabolites	B392	2	2	3
B498	Food microbiology	B271/B362	2	2	3
B499	Biological control	B271/B262	2	2	3

C. Supporting compulsory courses (12 credit hours)

Code	Courses Title	Pre-request	Hours / Week		
			Lect.	P/T	Credits
C250	Physical and inorganic chemistry	C100	2	3	3
C211	organic chemistry for non chemistry student	C105	2	3	3
Z324	Protozoology & parasitology	Z100	2	2	3
A215	Genetics	B100	2	2	3

D. Supporting elective courses (9 credit hours)

Code	Courses Title	Pre-request	Hours/Week		
			Lect.	P/T	Credits
Z240	General Entomology	Z100	2	2	3
MED318	Immunity	B271	2	2	3
P323	Biophysics	P105	3	0	3
A316	Design of experiments	B100	2	2	3
C460	Analytical Chemistry for Biology Students	C105	2	3	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

11-Courses to be offered for the B.Sc. Degree in Zoology

A) Compulsory Courses (57 Credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
Z210	Cytology	Z100	2	2	3
Z212	Histology	Z210	2	3	3
Z217	Animal Physiology I	Z100	2	3	3
Z220	Invertebrates I	Z100	2	2	3
Z222	Invertebrates II	Z220	2	2	3
Z225	Animal Ecology	Z100	2	3	3
Z232	Vertebrates I	Z100	.2	2	3
Z280	Fish Biology	Z232	2	3	3
Z295	Fish Farming	Z280	1	2	2
Z310	Animal Physiology II	Z217	2	3	3
Z311	Molecular Biology	Z210	1	3	2
Z312	Cell Biology	Z210	2	2	3
Z313	Animal Behavior	Z100	1	-	1
Z321	Parasitology	Z220	2	3	3
Z330	Vertebrates II	Z232	.2	2	3
Z334	Principles of Embryology	Z232	2	3	3
Z432	Vertebrate Comparative Anatomy	Z330	2	3	3
Z433	Vertebrate Taxonomy	Z330	2	2	3
Z437	Developmental Biology	Z334	2	3	3
Z438	Experimental Embryology	Z437	1	3	2
Z400	Research project	*	-	--	2

*** Accomplishing 100 credit hours**

Cont.10-Courses to be offered for the B.Sc. Degree in Zoology

B) Elective courses (27 Credit hours)

Code	Course Title	Prerequisites	Hours/week		
			Lect.	T/P	Credits
Z213	Evolution	Z100	1	-	1
Z219	Animal toxins and venoms	Z100	1	2	2
Z240	General Entomology	Z100	2	2	3
Z242	Insect Morphology	Z240	3	-	3
Z314	Genetic engineering	Z311	3	-	3
Z316	Histochemistry	Z212	2	2	3
Z317	Microtechnique	Z212	2	3	3
Z323	Aquatic ecology	Z225	2	3	3
Z328	Population Dynamics	Z225	2	2	3
Z333	Ornithology	Z330	2	2	3
Z336	Mammalogy	Z330	2	2	3
Z340	Insect Taxonomy	Z240	2	2	3
Z344	Medical Entomology and Insect Diseases	Z340	2	2	3
Z401	Special Topics in Zoology I	Department Consent	3	-	3
Z402	Special Topics in Zoology II	Department Consent	3	-	3
Z411	Physiology of Reproduction	Z310	3	-	3
Z412	Immunology	Z310	3	-	3
Z413	Hematology	Z310	2	2	3
Z414	Ecophysiology	Z310	3	-	3
Z422	Biodiversity	Z225	2	2	3
Z457	Special Topics in Entomology II	Department Consent	3	-	3
Z494	Fisheries Science	Z280	2	2	3
Z496	Fish Stock Assessment	Z280	2	2	3

Cont.11-Courses to be offered for the B.Sc. Degree in Zoology

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Prerequisites	Hours/week		
			Lect.	T/P	Credits
C211	Organic Chemistry for non-chemistry students	C105	2	3	3
C460	Analytical Chemistry for Biology Students	C105	2	3	3
A215	Genetics	Z210	2	2	3
MS 241	Biostatistics	M105	3	-	3

D. Supporting Elective courses (9 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
B291	General Microbiology	B100	2	3	3
G311	Historical Geology	G100	2	2	3
G211	General Paleontology	G100	2	2	3
A402	Population Genetics	A215	2	2	3
P323	Biophysics	P 105	3	-	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

12-Courses to be offered for the B.Sc. Degree of Entomology

A) Compulsory Courses (57 Credit hours)

Code	Course	Prerequisites	Hours/Week		
			Lect.	P/T	Credits
Z210	Cytology	Z100	2	2	3
Z212	Histology	Z210	2	3	3
Z220	Invertebrates (I)	Z100	2	2	3
Z222	Invertebrates (II)	Z220	2	2	3
Z240	General Entomology	Z100	2	2	3
Z242	Insect Morphology	Z240	2	2	3
Z317	Microtechnique	Z212	2	3	3
Z340	Insect Taxonomy	Z240	2	2	3
Z341	Insect Comparative Anatomy	Z242	2	2	3
Z342	Economic Entomology	Z340	2	2	3
Z343	Insect Physiology (I)	Z240	2	3	3
Z344	Medical Entomology and Insect Pathology	Z340	2	2	3
Z346	Insect-Plant Interactions	Z340	2	2	3
Z441	Insect Physiology (II)	Z343	2	2	3
Z442	Principles of Insect control	Z340	2	2	3
Z443	Insect Ecology	Z240	2	2	3
Z444	Insect Behavior	Z441	2	--	2
Z446	Specialized Field Training	Z340	1	4	3
Z447	Insect Immunity	Z343	2	---	2
Z400	Research Project or Article	*	-	---	2

***Accomplishing 100 credit hours.**

Cont.12-Courses to be offered for the B.Sc. Degree in Entomology

B) Elective Courses (21 Credit hours)

Code	Course	Prerequisites	Hours/week		
			Lect.	P/T	Credits
Z311	Molecular Biology	Z 210	2	3	3
Z312	Cell Biology	Z 210	2	2	3
Z316	Histochemistry	Z 212	2	2	3
Z351	Parasitic Insects	Z 220	2	2	3
Z352	Experiment Designing & Insect Rearing	Z 340	2	2	3
Z353	Insect Embryology	Z 240	2	2	3
Z354	Aquatic Insects	Z 340	2	2	3
Z451	Acarology	Z 222	2	2	3
Z452	Special topics in Entomology I	Department Consent	3	---	3
Z453	Pests of Stored Grains	Z340	2	3	3
Z454	Essentials of Insecticide Action	Z441	2	3	3
Z456	Insect Sociobiology	Z443	2	---	2
Z457	Special topics in Entomology II	Department Consent	3	---	3
Z458	Insect Sensory Ecology	Z343	1	---	1
Z459	Biological control	B442	2	2	3

Cont.12-Courses to be offered for the B.Sc. Degree in Entomology

C. Supporting Compulsory Courses (12 credit hours)

Code	Course	Prerequisites	Hours/Week		
			Lect.	P/T	Credits
C 211	Organic Chemistry for non-chemistry Students	C 105	**2**	**3**	**3**
C 460	Analytical Chemistry (for biology Students)	C 105	**2**	**3**	**3**
B 291	General Microbiology	B 100	**2**	**3**	**3**
A215	Genetics	Z 210	**2**	**2**	**3**

D. Supporting Elective courses (9 credit hours)

Code	Course	Prerequisites	Hours/week		
			Lect.	P/T	Credits
C343	Environmental Analyses	C105	3	---	3
MS241	Differential Equations for non-mathematical students	M105	3	-	3
P323	Biophysics	P105	3	---	3
B232	Taxonomy of Flowering Plants	B100	2	2	3
A310	Molecular Genetics	A215	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

13-Courses to be offered for the B.Sc. Degree in Fisheries

A. Compulsory Courses (57 credit hours)

The Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/ P	Credits
Z270	Aquatic Invertebrates	Z100	2	2	3
Z275	Aquatic Vertebrates	Z100	2	2	3
Z280	Fish Biology	Z275	2	3	3
Z282	Cell biology and fish embryology	Z280	2	2	3
Z284	Fish physiology	Z280	2	2	3
Z285	Fish Ecology	Z280	2	-	2
Z290	Aquatic Ecosystems	Z275	2	-	2
Z371	Fish population dynamics	Z285	2	2	3
Z372	Fish stock assessment and fisheries management	Z371	2	2	3
Z373	Commercial and recreational fisheries	Z285	2	-	2
Z374	Fisheries products and marketing	Z373	2	2	3
Z377	Techniques and methods in fish biology	Z280	2	2	3
Z378	Fishing methods and tools	Z373	2	2	3
Z379	Types and design of fish farms	Z280	2	2	3
Z400	Research Project	*	--	--	2
Z471	Fisheries economics	Z372	2	-	2
Z472	Fish nutrition and production	Z280	2	2	3
Z474	Fish parasites and diseases	Z280	2	2	3
Z481	Principles of reproduction and fish breeding	Z280	2	2	3
Z482	Fish hatchery Management	Z481	2	-	2
Z492	Fish Aquacultures	Z280	2	2	3

*** Accomplishing 100 credit hours**

Cont.13-Courses to be offered for the B.Sc. Degree in Fisheries

B. Elective courses (21 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/ P	Credits
Z291	Criteria of water quality	Z290	2	2	3
Z292	Biology of water pollution	Z291	2	2	3
Z293	Limnology	Z290	2	2	3
Z294	Marine biology	Z290	2	2	3
Z296	Fisheries climatology	Z290	2	2	3
Z297	Fish Zoogeography	Z290	2	2	3
Z319	Aquatic toxicology	Z290	2	2	3
Z327	Malacology	Z270	2	2	3
Z376	Fisheries environmental awareness	Z373	2	2	3
Z391	Biology and aquaculture of tilapias	Z280	2	2	3
Z392	Biology and aquaculture of African catfish	Z280	2	2	3
Z394	Wastewater aquaculture	Z280	2	2	3
Z 423	Aquatic Crustacea	Z 270	2	2	3
Z424	Aquatic biodiversity	Z270	2	2	3
Z427	Plankton and benthos	Z270	2	2	3
Z432	Vertebrate Comparative Anatomy	Z 275	2	3	3
Z473	Fisheries field projects	Z372	2	2	3
Z483	Hatchery field projects	Z482	2	2	3

Cont.13-Courses to be offered for the B.Sc. Degree in Fisheries

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/P	Credits
G205	Hydrobiology	G100	2	2	3
B291	General Microbiology	B100	2	2	3
A215	Genetics	Z210	2	2	3
MS241	Biostatistics	M105	3	-	3

D. Supporting Elective courses (9 credit hours)

Code	**Course Title**	**Prerequisite**	**Hours/Week**		
			Lect.	**T/ P**	**Credits**
C460	Analytical Chemistry for Biology Students	C105	2	3	3
A403	Genetic Applications in Fisheries managements	A215 Z372	2	2	3
G 320	Origin of Rivers and Lakes	G100	2	2	3
A402	Population Genetics	A215	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

14-Courses to be offered for the B.Sc. Degree in Physics (major)/Electronics (minor)

A. Compulsory Courses (57 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/ P	Credits
P212	Vibrations and Waves	P105, M105	3	-	3
P215	Modern Physics	P105	3	-	3
P223	Thermodynamics	P100	3	-	3
E228	Digital Circuit design	P261	4	2	5
P256	Physics of Metals, Alloys and Ceramics	P105	3	-	3
P261	Electricity and Magnetism & AC	P105	3	-	3
P265**	Electricity and Magnetism & AC Lab	P261	-	3	1
P271	Physical Optics and Optical Fibers	P105	3	-	3
P275***	Thermodynamics & Physical Optics Lab	P271, P223	-	3	1
EC325	Microprocessor	EE326	4	2	5
EP325	Industrial Electronics	P361	4	2	5
EE326	Electronic Circuits (1)	E228	4	2	5
P332	Plasma Physics and its Applications	P215	3	-	3
P353	Solid State Physics (1)	P215	3	-	3
P355**	Solid State Physics Lab	P353	-	3	1
P361	Electronics	P261	3	-	3
P365**	Electronics Lab (1)	P361	-	3	1
P451	Physics of Semiconductors and Thin Films and its Applications	P353	3	-	3
P455**	Semiconductors Physics Lab	P451	-	3	1
P400	Research Project /Article	*	-	-	2

* **Accomplishing 100 credit hours**

**

***

Cont. 14-Courses to be offered for the B.Sc. Degree in Physics/Electronics

B. Elective courses (21 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/ P	Credits
P315	Modern Physics Lab	P215	-	3	1
EE322	Electronics (3)	E228	4	2	5
P383	Environmental Physics	P105	3	-	3
P453	Magnetic Resonance & Mössbauer Spectroscopy	P353	3	-	3
P472	Laser Physics and its Applications	P271	3	-	3
EE422	Electronic Circuits (2)	EE326	4	2	5
P491	Special Topics in Physics (1)	department consent	3	-	3
P422	Low Temperature Physics and Superconductivity	P223	3	-	3
P462	Physical Measurements using Computers	M105, MC100 P105	3	-	3
P461	Electronics Lab (2)	P361	-	3	1

Cont.14-Courses to be offered for the B.Sc. Degree in Physics/Electronics

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/ P	Credits
MC251	Object-Oriented Programming	MC105	2	2	3
MC252	Data Structures	MC251	2	2	3
MC351	Operating system	MC251	2	2	3
MC354	Algorithms	MC351	2	2	3

D. Supporting Elective courses (9 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	T/ P	Credits
M223	Discrete Mathematics	M105	2	-	2
MC361	Logic Circuits	MC100	2	2	3
MC364	Programming Languages Theory	MC252	2	2	3
MC453	Computer Security	MC354	2	-	2
MC452	Distributed Computing	M223, MC354	2	-	2
MC300	Mathematical and Statistical Packages	MC100	2	2	3

15-Courses to be offered for the B.Sc. Degree in Physics/Chemistry

A. Compulsory Courses (72 Credit hours)

A.1. Compulsory physics Courses

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
P212	Vibrations and Waves	P105, M105	3	-	3
P215	Modern Physics	P105	3	-	3
P256	Physics of Metals, Alloys and ceramics	P105	3	-	3
P261	Electricity and Magnetism & AC	P105	3	-	3
P265**	Electricity and Magnetism & AC Lab	P261	-	3	1
P271	Physical Optics and Optical Fibers	P105	3	-	3
P315	Modern Physics Lab	P215	-	3	1
P311	Quantum mechanics (1)	P215, M211	3	-	3
P342	Nuclear Physics (1)	P215	3	-	3
P345**	Nuclear Physics Lab	P342	-	3	1
P353	Solid State Physics (1)	P215	3	-	3
P355**	Solid State Physics Lab	P353	-	3	1
P361	Electronics (1)	P261	3	-	3
P365**	Electronics Lab(1)	P361	-	3	1
P451	Physics of Semiconductors & Thin Films and its Applications	P353	3	-	3
P455**	Semiconductors Physics Lab	P451	-	3	1

A.2. Compulsory chemistry Courses

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
C210	Organic Chemistry I	C105	3	0/3	4
C212	Organic Chemistry II	C210	3	0/3	4
C220	Inorganic chemistry I	C100	2	-	2
C230	Physical chemistry I	C 100	3	-	3
C232	Physical chemistry II	C230	3	-	3
C240	Introductory Quantitative Analysis	C105	2	0/3	3
C313	Photochemistry and Reactive Intermediates	C212	3	-	3
C320	Inorganic Chemistry Lab (I)	C321**	-	0/3	1
C321	Inorganic chemistry II	C220	3	-	3
C331	Physical chemistry Lab (I)	C230**	-	0/3	1
C413	Chemistry of Bimolecular	C212	2	0/3	3
C415	Advanced Practical Organic Chemistry	C313**	-	3	1
C445	Instrumental Methods of Analysis	C240	2	3	3
P400/C400	Research Project/Article	*			2

*** Accomplishing 100 Credit hours,**
****Concurrent**

Cont.15-Courses to be offered for the B.Sc. Degree in Physics/Chemistry

B) Elective Courses (6 Credit hours)

B.1. Physics Courses (3 Credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
P383	Environmental Physics	P105	3	-	3
P453	Magnetic Resonance & Mössbauer Spectroscopy	P353	3	-	3
P472	Laser Physics and its Application	P271	3	-	3
P491	Special Topics in Physics (1)	department consent	3	-	3
P422	Low Temperature Physics and Superconductivity	P223	3	-	3
P444	Radiation Physics, Radiation Pollution and Protection of Radiation	P342	3	-	3
P458	Physics of Nano-materials and its Applications	P256	3	-	3

B.2. Chemistry (3 Credit hours)

Code	The Course	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
C214	Environmental and green chemistry	C212	3	-	3
C332	Physical Chemistry III	C232	3	-	3
C324	Inorganic Chemistry III	C321	3	-	3
C444	Selected topics in Analytical Chemistry	Department consent	3	-	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3

Cont.15-Courses to be offered for the B.Sc. Degree in Physics/Chemistry

C) Supporting Compulsory Courses (12 Credit hours)

Code	Course Title	Pre-requisites	Hours/week		
			Lect.	T/P	Credits
MC 251	Object-Oriented Programming	MC100	2	2	3
M211	Advanced Calculus	M105	2	2	3
M212	Differential Equations I	M 211	2	2	3
Ms241	Biostatistics	M105	3	-	3

D) Supporting Elective Courses (9 Credit hours)

Code	Course Title	Prerequisites	Hours/week		
			Lect.	T/P	Credits
M323	Numerical Analysis I	M212	3	-	3
G 231	Crystals and Optics	G100	2	3	3
Z 318	Cell & Molecular Biology	Z100	2	2	3
B291	General Microbiology	B100	2	3	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

16-Courses to be offered for the B.Sc. Degree in Mathematics/Physics

A. Compulsory Courses (72 Credit Hours)

A.1.Physics Courses

Code	Course title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
P212	Vibrations and Waves	P105, M105	3	-	3
P215	Modern Physics	P105	3	-	3
P223	Thermodynamics	P100	3	-	3
P261	Electricity and Magnetism & AC	P105	3	-	3
P265**	Electricity and Magnetism & AC Lab	P261	-	3	1
P271	Physical Optics and Optical Fibers	P105	3	-	3
P275***	Thermodynamics & Physical Optics Lab	P271 , P223	-	3	1
P311	Quantum mechanics (1)	P215, M211	3	-	3
P342	Nuclear Physics (1)	P215	3	-	3
P345**	Nuclear Physics Lab	P342	-	3	1
P353	Solid State Physics (1)	P215	3	-	3
P355**	Solid State Physics Lab	P353	-	3	1
P361	Electronics (1)	P261	3	-	3
P365**	Electronics Lab (1)	P361	-	3	1
P451	Physics of Semiconductors & Thin Films and its Applications	P353	3	-	3
P455**	Semiconductors Physics Lab	P451	-	3	1

A.2. Mathematics Courses

Code	Course title	Pre-requisites	Hours / week		
			Lect.	P/T	Credits
M211	Advanced Calculus	M105	2	2	3
M212	Differential Equations (1)	M211	2	2	3
M221	Linear Algebra and Geometry	M105	2	2	3
M223	Discrete Mathematics	M105	2	-	2
M231	Newtonian Mechanics	M105	2	2	3
M232	Analytical Mechanics	M231	2	2	3
M312	Real Analysis (1)	M211	3	-	3
M323	Numerical Analysis (1)	M212	3	-	3
M331	Mathematical Foundations of Quantum Theory & Statistical Mechanic (1)	M232	2	2	3
M431	Hydrodynamic & Elasticity (2)	M232	2	2	3
M411	Functional Analysis	M312	2	-	2
M412	Complex Variables	M312	3	-	3
M400, M400	Research Project/Article	*	-	-	2

*** Accomplishing 100 credit hours**

****Concurrent**

Cont.16-Courses to be offered for the B.Sc. Degree in Mathematics/Physics

B. Elective Courses (6 Credit Hours)

B.1. Physics Courses (3 Credit Hours)

Code	Course title	Pre-requisite	Hours / week		
			Lect.	P/T	Credits
P332	Plasma Physics and its Applications	P215	3	-	3
P381	Astrophysics	P105	3	-	3
P422	Low Temperature Physics and Superconductivity	P223	3	-	3
P472	Laser Physics and its Applications	P271	3	-	3
P491	Special Topics in Physics (1)	Dep. consent	3	-	3
P492	Special Topics in Physics (2)	Dep. consent	3	-	3

B.2. Mathematics Courses (3 Credit Hours)

Code	Course title	Pre-requisite	Hours/Week		
			Lect.	P/T	Credits
M326	Operation Research (1)	M211, M221	3	-	3
M318	Partial Differential and Special Functions	M212	3	-	3
M335	Special Topics in Applied Mathematics	Department consent	3	-	3

Cont.16-Courses to be offered for the B.Sc. Degree in Mathematics/Physics

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	P/T	Credits
MS242	Probability (1)	M211	2	2	3
MC251	Object-Oriented Programming	MC100	2	2	3
MC252	Data Structures	MC251	2	2	3
MC351	Operating system	MC251	2	2	3

D. Supporting Elective Courses (9 Credit hours)

Code	Course Title	Prerequisite	Hours / week		
			Lect.	P/T	Credits
MC353	Algorithms	M323, MC252	2	2	3
MC354	Computer Networks	MC351	2	2	3
MC357	Databases	MC252	2	2	3
MS442	Mathematical Statistics	MS242	3	-	3
MC453	Computer Security	MC354	2	-	2
MC457	Theory of Computation	M223, MC353	2	-	2
MC300	Mathematical and Statistical Packages	MC100	2	2	3

17-Courses to be offered for the B.Sc. Degree in Geology/Chemistry

A. Compulsory Courses (72 Credit Hours)

A.1. Geology Courses

Code	Course Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
G210	Stratigraphy	G100	2	2	3
G215	Invertebrate Paleontology	G100	2	2	3
G230	Rock Forming Minerals	G100	2	2	3
G233	Crystallography	G100	1	3	2
G235	Mineral Optics	G100	2	2	3
G250	Principles of Geophysics	G100	1	2	2
G306	Field Geology	G230	1	3	2
G324	Principles of Petrology	G230	3	3	4
G335	Principles of Petrology	G324	1	-	1
G345	Elements of structural Geology	G100	1	2	2
G405	Field Training	G306	-	3	1
G410	Geological Map of Egypt	G210	1	2	2
G433	Geochemistry	G230	2	2	3
G438	Ore forming processes	G230	1	3	2
G460	Hydrogeology I & Petroleum Geology I	G230	2	3	3

A.2. Chemistry Courses

Code	Course title	Pre-requisites	Hours / week		
			Lect.	P/T	Credits
C210	Organic Chemistry I	C105	3	3	4
C212	Organic Chemistry II	C210	3	3	4
C220	Inorganic chemistry I	C100	2	-	2
C230	Physical chemistry I	C100	3	-	3
C232	Physical chemistry II	C230	3	-	3
C240	Introductory Quantitative Analysis	C105	2	3	3
C313	Photochemistry & Reactive Intermediates	C 212	3	-	3
C320	Inorganic Chemistry Lab(I)	C321**	-	3	1
C321	Inorganic chemistry II	C220	3	-	3
C331	Physical chemistry Lab. (I)	C230**	-	3	1
C413	Chemistry of Bimolecular	C212	2	3	3
C415**	Advanced Practical Organic Chemistry	C313	-	3	1
C445	Instrumental Methods of Analysis	C240	2	3	3
G400/C400	Research Project/Article	*	-	-	2

*** Accomplishing 100 credit hours.**
**** Concurrent**

Cont.17-Courses to be offered for the B.Sc. Degree in Geology/Chemistry

B. Elective Courses (6 Credit Hours)

B.1. Geology Courses (3 Credit Hours)

Code	Course title	Pre-requisite	Hours / week		
			Lect.	P/T	Credits
G201	Environmental Geology & Geomorphology	G100	2	2	3
G240	Geographic Information Systems (GIS)	MC100	2	2	3
G305	special topics in Geology	Department consent	2	2	3
G319	Chrono-& Chemostratigraphy	G210	2	2	3
G330	Environmental Geochemistry	Department consent	2	2	3
G401	Geostatistic	G250	2	2	3
G430	Geotectonics & Isotope Geology	G230	2	2	3

B.2. Chemistry Courses (3 Credit Hours)

Code	Course title	Pre-requisite	Hours/Week		
			Lect.	P/T	Credits
C214	Environmental and green chemistry	C212	3	-	3
C332	Physical Chemistry II	C232	3	-	3
C324	Inorganic Chemistry III	C321	3	-	3
C444	Special Topics in Analytical Chemistry	Department consent	3	-	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3

Cont. 17-Courses to be offered for the B.Sc. Degree in Geology/Chemistry

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Prerequisite	Hours / week		
			Lect.	P/T	Credits
EN200	Plane Surveying	M100	2	2	3
MS241	Biostatistics	M105	3	-	3
M211	Differentiation Equations (1)	M105	2	2	3
P225	Introduction to Modern Physics	P105	2	2	3

D. Supporting Elective Courses (9 Credit hours)

Code	Course Title	Prerequisite	Hours/Week		
			Lect.	P/T	Credits
M214	Differentiation equations for non mathematical students	M105	2	2	3
P323	Biophysics	P105	3	-	3
P350	Introduction to Solid state physics	P225	2	3/-	3
P352	Diffractions of waves and its applications	P225	3	-	3
Z318	Cell and Molecular Biology	Z100	2	3	3
EN420	Hydrology	G340	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

18-Courses to be offered for the B.Sc. Degree in Chemistry/Botany

A. Compulsory courses (72 credit hours)

Code	Title Courses	Pre-request	Hours/Week		
			Lect.	P/T	Credits
B211	Economic botany	B100	1	-	1
B221	Plant morphology and anatomy	B100	2	2	3
B232	Taxonomy of flowering plants	B100	2	2	3
B241	Plant ecology	B100	2	2	3
B251	Plant physiology	B100	2	2	3
B291	General microbiology	B100	2	3	3
B312	Bryophyta, Pteridophyta & Gymnosperm	B100	2	2	3
B332	Advanced plant taxonomy	B221	2	2	3
B334	**Flora of Egypt	B232	2	2	3
B341	Phytogeography	B241	2	-	2
B342	Plant sociology	B241	2	2	3
B351	Mineral nutrition	B251	2	2	3
B352	Plant biochemistry	B251	2	2	3
C210	Organic Chemistry I	C105	3	3	4
C212	Organic Chemistry II	C210	3	3	4
C220	Inorganic chemistry I	C00	2	-	2
C230	Physical chemistry I	C100	3	-	3
C232	Physical chemistry II	C230	3	-	3
C240	Introductory Quantitative Analysis	C105	2	3	3
C313	Photochemistry & Reactive Intermediates	C212	3	-	3
C320	Inorganic Chemistry Lab(I)	C321***	-	3	1
C321	Inorganic chemistry II	C 220	3	-	3
C331	Physical chemistry Lab. (I)	C230***	-	3	1
C413	Chemistry of Bimolecular	C212	2	3	3
C415	Advanced Practical Organic Chemistry	C313	-	3	1
C445	Instrumental Methods of Analysis	C240	2	3	3
C400/ B400	Research project or article	*	-	-	2

*** Accomplishing 100 Credit hours**

**** Excursion**

*****Concurrent**

Cont.18-Courses to be offered for the B.Sc. Degree in Chemistry/Botany

B. Elective courses (6 credit hours)

B.1. Botany Elective courses (3 credit hours)

Code	Courses Title	Pre-request	Hours / Week		
			Lect.	P/T	Credits
B261	Mycology	B100	2	2	3
B273	Phycology	B100	2	2	3
B323	Plant cytology	B100	1	2	2
B364	Plant pathogenic Fungi	B261	2	2	3
B431	Palynlogy	B232	2	2	3
B452	Secondary plant metabolism	B251	2	2	3
B453	Biotechnical analysis	B251	2	2	3
B454	Tissue culture	B251	2	2	3

B.2. Chemistry Elective Courses (3 credit hours)

Code	Courses Title	Pre-request	Hours / Week		
			Lect.	P/T	Credits
C214	Environmental and green chemistry	C212	3	-	3
C332	Physical Chemistry II	C232	3	-	3
C324	Inorganic Chemistry III	C321	3	-	3
C444	Special Topics in Analytical Chemistry	Department consent	3	-	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3

C. Supporting compulsory courses (12 credit hours)

Code	Courses Title	Pre-request	Hours / Week		
			Lect.	P/T	Credits
G219	Plant fossils	G100	2	2	3
A215	Genetics	B100	2	2	3
G234	Crystallography & optical mineralogy	G100	2	2	3
MS241	Biostatics	M105	3	-	3

D. Supporting elective courses (9 credit hours)

Code	Courses Title	Pre-request	Hours / Week		
			Lect.	P/T	Credits
Z240	General Entomology	Z100	2	2	3
P323	Biophysics	P105	3	-	3
A312	Pesticides	B100	2	2	3
M211	Advanced calculates	M105	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

19-Courses to be offered for the B.Sc. Degree in Chemistry/Microbiology

A. Compulsory courses (72 credit hours)

Code	Courses Title	Pre-requisites	Hours / Week		
			Lect.	P/T	Credits
B212	Molecular biology	B100	2	-	2
B221	Plant morphology and anatomy	B100	2	2	3
B251	Plant physiology	B100	2	2	3
B262	Systematic mycology (1)	B100	2	2	3
B271	Bacteriology	B100	2	2	3
B273	Phycology	B100	2	2	3
B281	Virology	B100	2	2	3
B362	Systematic mycology (2)	B262	2	2	3
B363	Physiology of Fungi	B262	2	2	3
B364	Plant Pathogenic Fungi	B262	2	2	3
B366	Host-parasite relationships	B262	1	-	1
B393	Microbial toxins	B271/B262	2	2	3
B396	Industrial microbiology**	B363	2	2	3
C210	Organic Chemistry I	C105	3	3	4
C212	Organic Chemistry II	C210	3	3	4
C220	Inorganic chemistry I	C100	2	-	2
C230	Physical chemistry I	C100	3	-	3
C232	Physical chemistry II	C230	3	-	3
C240	Introductory Quantitative Analysis	C105	2	3	3
C313	Photochemistry & Reactive Intermediates	C212	3	-	3
C320	Inorganic Chemistry Lab(I)	C321***	-	3	1
C321	Inorganic chemistry II	C220	3	-	3
C331	Physical chemistry Lab. (I)	C230***	-	3	1
C413	Chemistry of Bimolecular	C212	2	3	3
C415	Advanced Practical Organic Chemistry	C313	-	3	1
C445	Instrumental Methods of Analysis	C240	2	3	3
C400/B400	Research project/ Article	*	-	-	2

***** Accomplishing 100 Credit hours**
****** Excursion**
******* Concurrent**

Cont.19-Courses to be offered for the B.Sc. Degree in Chemistry/Microbiology

B. Elective Courses **(6 credit hours)**

B.1. Botany Elective Courses **(3 credit hours)**

Code	Courses Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
B232	Taxonomy of flowering plants	B100	2	2	3
B361	Biology of aquatic Fungi	B262	2	2	3
B392	Microbial metabolism	B271/B262	2	2	3
B453	Biotechnical analysis	B251	2	2	3
B494	Microbial ecology	B100	2	2	3
B498	Food microbiology	B271 / B362	2	2	3

B.2- Chemistry Elective Courses **(3 credit hours)**

Code	Courses Title	Pre-request	Hours / Week		
			Lect.	P/T	Credits
C214	Environmental and green chemistry	C212	3	-	3
C332	Physical Chemistry III	C232	3	-	3
C324	Inorganic Chemistry III	C321	3	-	3
C444	Special Topics in Analytical Chemistry	Department consent	3	-	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3

Cont.19-Courses offered for the B.Sc. Degree in Chemistry/Microbiology

C. Supporting compulsory courses (12 credit hours)

Code	Courses Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
Z324	Protozoology and parasitology	Z100	2	2	3
A215	Genetics	B100	2	2	3
G234	Crystallography & optical mineralogy	G100	2	2	3
MS241	Biostatistics	M105	3	-	3

D. Supporting elective courses (9 credit hours)

Code	Courses Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
A316	Design of experiments	B100	2	2	3
MED318	Immunity	B271	2	2	3
P323	Biophysics	P105	3	-	3
M211	Advanced calculates	M105	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

20-Courses to be offered for the B.Sc. Degree in Chemistry/ Zoology

A) Compulsory Courses (72 Credit hours)

A.1. Chemistry courses

Code	Course title	Pre-requisite	Hours/Week		
			Lect.	T/P	Credits
C210	Organic Chemistry I	C105	3	3	4
C212	Organic Chemistry II	C210	3	3	4
C220	Inorganic chemistry I	C100	2	-	2
C230	Physical chemistry I	C100	3	-	3
C232	Physical chemistry II	C230	3	-	3
C240	Introductory Quantitative Analysis	C105	2	3	3
C313	Photochemistry & Reactive Intermediates	C212	3	-	3
C320	Inorganic Chemistry Lab(I)	C321**	-	3	1
C321	Inorganic chemistry II	C 220	3	-	3
C331	Physical chemistry Lab. (I)	C230**	-	3	1
C413	Chemistry of Bimolecular	C212	2	3	3
C415	Advanced Practical Organic Chemistry	C313**	-	3	1
C445	Instrumental Methods of Analysis	C240	2	3	3

* **Accomplishing 100 Credit hours**

** **Concurrent**

A.2. Zoology courses

Code	Course Title	Pre-requisite	Hours/week		
			Lect.	T/P	Credits
Z210	Cytology	Z100	2	2	3
Z212	Histology	Z210	2	3	3
Z217	Animal Physiology I	Z100	2	3	3
Z220	Invertebrates I	Z100	2	2	3
Z225	Animal Ecology	Z100	2	3	3
Z232	Vertebrates I	Z100	.2	2	3
Z280	Fish Biology	Z232	2	3	3
Z311	Molecular Biology	Z210	2	3	3
Z314	Genetic engineering	Z311	3	-	3
Z316	Histochemistry	Z212	2	2	3
Z321	Parasitology	Z220	2	3	3
Z334	Principles of Embryology	Z232	2	3	3
Z432	Economic Entomology	Z275	2	3	3
C400/ Z400	Research Project/Article	*	-	--	2

*** Accomplishing 100 Credit hours**

Cont. 20-Courses to be offered for the B.Sc. Degree in Chemistry/Zoology

B) Elective courses **(6 credit hours)**

B.1. Chemistry courses **(3 credit hours)**

Code	Course title	Pre-requisite	Hours/Week		
			Lect.	T/P	Credits
C214	Environmental and green chemistry	C212	3	-	3
C332	Physical Chemistry III	C232	3	-	3
C324	Inorganic Chemistry III	C321	3	-	3
C444	Selected Topics in Analytical Chemistry	Department consent	3	-	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3	3

B.2. Zoology Courses **(3 credit hours)**

Code	**Course Title**	**Pre-requisite**	**Hours/week**		
			Lect.	**T/P**	**Credits**
Z219	Animal venoms and toxins	Z100	1	2	2
Z222	Invertebrates II	Z220	2	2	3
Z295	Fish Farming	Z280	1	2	2
Z310	Animal Physiology II	Z217	2	3	3
Z313	Animal Behavior	Z100	1	-	1
Z317	Micro-technique	Z212	2	2	3
Z323	Aquatic ecology	Z 225	2	3	3
Z401	Special Topics in Zoology I	Department Consent	3	-	3
Z402	Special Topics in Zoology II	Department Consent	3	-	3
Z412	Immunology	Z310	3	-	3
Z413	Hematology	Z310	2	2	3
Z414	Eco-physiology	Z310	3	-	3
Z437	Developmental Biology	Z334	2	3	3

Cont. 20-Courses to be offered for the B.Sc. Degree in Chemistry/Zoology

C. Supporting Compulsory Courses (12 credit hours)

Code	Course Title	Prerequisites	Hours/week		
			Lect.	T/P	Credits
A215	Genetics	Z210	2	2	3
MS 241	Biostatics	M105	3	-	3
P225	Introduction to Modern physics	P105	2	-/2	3
B291	General Microbiology	B100	2	3	3

D. Supporting Elective courses (9 credit hours)

Code	Course Title	Prerequisites	Hours/Week		
			Lect.	T/P	Credits
G311	Historical Geology	G100	2	2	3
G211	Paleontology	G100	2	2	3
A402	Population Genetics	A215	2	2	3
M214	Differential Equations for non-mathematical students	M105	2	2	3
P323	Biophysics	P105	3	-	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3

21-Courses to be offered for the B.Sc. Degree in Entomology/chemistry

A) Compulsory Courses (72 Credit hours)

Code	Course	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
Z220	Invertebrates (I)	Z100	2	2	3
Z222	Invertebrates (II)	Z220	2	2	3
Z240	General Entomology	Z100	2	2	3
Z210	Cytology	Z100	2	2	3
Z212	Histology	Z210	2	3	3
Z242	Insect Morphology	Z240	2	2	3
Z340	Insect Taxonomy	Z240	2	2	3
Z342	Economic Entomology	Z340	2	2	3
Z343	Insect Physiology (I)	Z240	2	3	3
Z344	Medical Entomology and Insect Diseases	Z340	2	2	3
Z442	Principles of Insect Control	Z340	2	2	3
Z447	Insect Immunity	Z343	2	---	2
C210	Organic Chemistry I	C105	3	3	4
C212	Organic Chemistry II	C210	3	3	4
C220	Inorganic chemistry I	C100	2	-	2
C230	Physical chemistry I	C100	3	-	3
C232	Physical chemistry II	C230	3	-	3
C240	Introductory Quantitative Analysis	C105	2	3	3
C313	Photochemistry and Reactive Intermediates	C212	3	-	3
C320	Inorganic Chemistry Lab(I)	C321**	-	3	1
C321	Inorganic chemistry II	C220	3	-	3
C331	Physical chemistry Lab. (I)	C230**	-	3	1
C413	Chemistry of Bimolecular	C 212	2	3	3
C415	Advanced Practical Organic Chemistry	C313	-	3	1
C445	Instrumental Methods of Analysis	C240	2	3	3
Z400/ C400	Research Project/ Article	*	-	---	2

*** Accomplishing 100 Credit hours**
**** Concurrent**

Cont.21-Courses to be offered for the B.Sc. Degree in Entomology/Chemistry

B) Elective Courses **(6 credit hours)**

B.1. Entomology Courses **(3 credit hours)**

Code	Courses Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
Z441	Insect Physiology (II)	Z343	2	2	3
Z443	Insect Ecology	Z240	2	2	3
Z444	Insect Behavior	Z441	2	---	2
Z316	Histo-chemistry	Z212	2	2	3
Z351	Parasitic Insects	Z220	2	2	3
Z451	Acarology	Z222	2	2	3
Z446	Specialized Field Training	Z340	1	4	3

B.2. Chemistry Courses **(3 credit hours)**

Code	Courses Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
C214	Environmental and green chemistry	C212	3	-	3
C332	Physical Chemistry III	C232	3	-	3
C324	Inorganic Chemistry III	C321	3	-	3
C444	Selected Topics in Analytical Chemistry	Department consent	3	-	3
C451	Chemistry of Petroleum and Petrochemicals	C105	2	3/0	3

Cont. 21-Courses offered for the B.Sc. Degree in Entomology/Chemistry

C. Supporting Compulsory Courses (12 credit hours)

Code	Courses Title	Pre-requisites	Hours/Week		
			Lect.	P/T	Credits
B 291	General Microbiology	B100	2	2	3
A215	Genetics	Z210	2	2	3
MS241	Biostatistics	M105	3	-	3
G234	Crysallography and Optical mineralogy	G100	2	2	3

D. Supporting Elective Courses (9 Credit hours)

Code	**Courses Title**	**Pre-requisites**	**Hours/Week**		
			Lect.	**P/T**	**Credits**
B 232	Taxonomy of Flowering Plants	B100	2	2	3
A310	Molecular Genetics	A215	2	2	3
P 323	Biophysics	P105	3	---	3
M214	Differential Equations for non-mathematical students	M105	2	2	3
MC300	Mathematical and Statistical Packages	MC100	2	2	3