

KINGDOM OF SAUDI ARABIA
MINISTRY OF EDUCATION
KING SAUD UNIVERSITY
COLLEGE OF SCIENCE
DEPARTMENT OF BOTANY &
MICROBIOLOGY



المملكة العربية السعودية
وزارة التعليم
جامعة الملك سعود
كلية العلوم
قسم النبات والأحياء الدقيقة

*HANDBOOK OF BOTANY
AND MICROBIOLOGY
DEPARTMENT*

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Welcome to the Handbook of Botany and Microbiology

Department

Over the years this Department has developed significantly in the number of faculty members, lecturers, technicians, equipment and laboratories. Currently, it has more than 55 faculty members in different specializations in the fields of Botanical and Microbiological sciences. They contribute to research in numerous fields and publish in the most prestigious scientific periodicals and journals, besides editing, translating, authoring many scientific books.

Through this Department's guide book, you can easily get any information you need about the academic programs and study plans concerning undergraduate and postgraduate studies. You also can obtain information about staff members in the Department, their contact information, specialization fields, personal websites and authored or translated books.

We will do our best to keep this guide book updated and more useful.

Head of the Department

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<https://sciences.ksu.edu.sa/ar/node/115>

About the Department

The Department of Botany and Microbiology is an educational institution and research responsible for the development and publication of knowledge in different areas of plant science and microbiology. The Department of Botany and Microbiology provides excellent opportunities for education in accordance with high academic standards in all areas of knowledge related to plant science and microbiology. Its efforts are aimed at all levels of interested Saudis and others to contribute to their qualification to participate in the comprehensive development through their various roles such as the General education in the Ministry of Education, Higher Education, the Saudi universities, the Ministry of Health, the Ministry of Agriculture, the Ministry of Water and Electricity, the Ministry of Trade and Industry, the General Authority for Standardization, the General Authority for Metrology and Environment Protection, the National Commission for Wildlife Conservation and Development, and various private institutions. The Department works on the continuous development of knowledge through scientific research to provide practical solutions and specialized professional advice to institutions dealing with services, productivity and development processes to help them perform their duties in the overall development. The Department is also interested in raising intellectual and cultural awareness of the community and the protection of the environment.

The Department of Botany and Microbiology has two programs, each with different vision, mission and goals:

Botany Program:

Vision

Upgrading teaching and research to keep pace with the scientific progress and the requirements of society.

Mission

Providing distinguished education and advanced scientific research to meet the needs of the community through an innovative and stimulating academic and administrative environment, with the optimal use of technology and local and international partnership in the field of Botany.

Objectives

- 1) Achieve excellence in education and scientific research in the field of plant sciences and its applications.
- 2) Develop and implement ways and means to ensure quality performance and output in Botany program.
- 3) Optimal use of modern technology in education and scientific research.

- 4) Providing an advanced academic and administrative environment capable of attracting the best faculty, researchers, students and staff.
- 5) Building effective local and international partnerships with academic institutions and research centers specializing in plant sciences.

Microbiology Program:

Vision

Upgrading teaching and research to keep pace with the scientific progress and the requirements of society.

Mission

Developing the educational process and the scientific research through clear vision and strategic planning, beside training of national cadres, and applying modern methodology to achieve different developmental activities needed by the society in the fields of microbiology.

Objectives

1. Achieving high quality in education and scientific research in the fields of Microbiology and its applications.
2. Optimal use of modern technologies in education and scientific research.
3. Applying updated suitable measures to evaluate the performance and ensure the quality of microbiology program outcomes.
4. Providing an academic and administrative environment stimulating the excellence in education and scientific research.
5. Attracting of distinguished of faculty staff, researchers and students.
6. Establishing communication links with prominent national and international scientific communities.
7. Implementing of advanced training programs to increase the graduate's skills in the fields of Microbiology.

The Department's Goals:

First: the preparation of specialists in Botanical and microbiological sciences, characterized by the following capabilities:

- 1 - Innovation in research and study to qualify to be appointed as administrators in universities.
- 2 - The ability to apply and analyze as laboratory technician and an assistant researcher at the university.
- 3 – Qualified to work as teachers in the Ministry of Education.
- 4 - Qualified to work as laboratory technicians in laboratories and medical centers in government and private hospitals.

5 - Qualified to work as researchers in the Ministry of Agriculture and the National Commission for Wildlife Conservation and Development.

6 - Qualified to work as researchers in the Commission of Meteorology and Environmental Protection and other related government and private sectors.

Second: To contribute effectively to the overall development through scientific research in different areas of plant science and microbiology.

Third: To contribute effectively to the development of programs necessary for the maintenance of wild life in the Kingdom of Saudi Arabia, through scientific research and cooperation with bodies and related institutions.

The Department's Learning Outcomes:

At the end of the programme the students will be able to:

1·0 Knowledge:

- 1.0 Recognize the basic concepts of microbiology.
- 1.1 Define the different types of microorganisms (bacteria, fungi, algae and viruses).
- 1.2 Identify some microorganisms and their role in medical, agricultural, Industrial, and pharmaceutical fields.
- 1.3 Describe the interactions between microorganisms itself and/or others.
- 1.4 Recall the traditional and molecular approaches for microbial identification.

2·0 Cognitive Skills:

- 2.1 Apply the different techniques of microorganism's detection in food, human health and environment in the medical laboratories, companies and institutions.
- 2.2 Analyze the different sources of microorganism and evaluate its implications on human.
- 2.3 Design research project, collect, analyses, interpret and evaluate data.

3·0 Interpersonal Skills and Responsibility:

- 3.1 Work independently and as a part of team.

- 3.2 Learn independently with open-mindedness and critical inquiry.
- 3.3 Learn effectively for the purpose of continuing professional development.
- 3.4 Appreciate ethical problems associated with research in biology and technological applications.

4.0 *Communication, Information Technology, Numerical*

- 4.1 Access into scientific databases and software, which are used in microbiological field.
- 4.2 Prepare and present academic presentations, which is crucial them in working life.
- 4.3 Utilize statistical programs in microbiological experiments.
- 4.4 Use references management software of scientific publication.

5.0 *Psychomotor*

- 5.1 Use the instruments related to microbiological section
- 5.2 Prepare different type of culture media, which are used in microorganism's cultivation.
- 5.3 Manipulate different techniques, which are used in microbiological experiments.
- 5.4 Collect different samples from environmental and clinical sectors according to standard collection methods.

The Department of Botany was established with the establishment of the College of Science in 1378 (1958) and is the oldest department specialized in the study of plant sciences in the Kingdom. The Females' Branch was opened on the beginning of the academic year 1403/1404 H. In 1407 H (1978) a Microbiology specialization was started alongside with the Botany Specialization opening the way to a change of the name of the Department to become, in 1410 H, "the Department of Botany and Microbiology" permitting the Department to confer a Bachelor's Degree in Botany and Microbiology as well as a double degree (Botany - Microbiology). The Department has embarked, since 1401 H (1981), on graduate studies to confer a Master's Degree in Botany. In 1417 (1997), the College Council, the College of Graduate Studies, and the University Council approved plans of offering two doctoral degrees in Botany and Microbiology for both male and female students. The registration started in the second semester of the academic year 1417/1418 H (1997/1998 G). In addition, the Department has begun, in collaboration with the Department of Zoology and the College of Agriculture, conferring a Master's Degree in biodiversity. The Department of Botany and Microbiology is located in the north-western part of Building No. 5 of the College of Science. It includes more than 20 laboratories for teaching and 28 laboratories for specialized research and a central laboratory; all equipped with many scientific instruments, in addition to several classrooms for lectures, as well as a herbarium containing more than 4000 herbarium specimens that are reserved in a special way to make them look natural. This Herbarium is not only regarded as an important reference to the plants of the Arabian Peninsula, but also serves the practical teaching and research in King Saud University. In addition to the Herbarium, there is a Botanical Garden that contains many wild plants belonging to different environmental types.

The Department includes the Females' Branch located in the University Studies Centre for Girls, which offers Bachelor's, Master's, and Doctoral degrees. Presently, there are more than 55 faculty members (males and females), and a number of lecturers, teaching assistants, assistant researchers, and technicians. In the second semester, last year, the number of students in the Department of Botany and Microbiology was 134 male students and 277 female students. The Department sends a number of its graduates abroad to obtain higher qualifications in different disciplines in accordance with the Department's plans. The Department has a Service Unit (the Central Laboratory for Research) containing the latest technical equipment's, as well as an integrated unit for microscopic preparations to assist in the research of faculty members and graduate students.

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Job Opportunities:

The Department confers two Bachelor's Programs; B.Sc. Botany and B.Sc. Microbiology. The graduates of both B.Sc. Botany and of B. Sc. Microbiology can apply for jobs in the following ministries and institutions:

B.Sc. Botany	B. Sc. Microbiology
The Ministry of Education - Saudi universities	The Ministry of Education - Saudi universities
King Abdul Aziz City for Science and Technology	King Abdul Aziz City for Science and Technology
Ministry of Agriculture and its affiliated institutes	Ministry of Agriculture and its affiliated institutes
Tissue culture laboratories	Medical laboratories
The Saudi Arabian Standards Organization	The Saudi Arabian Standards Organization
Saudi Food and Drug Administration (SFDA)	Saudi Food and Drug Administration (SFDA)
The General Presidency of Meteorology and Environment Protection	The General Presidency of Meteorology and Environment Protection
The Grain and Flour Mill Organization (GSFMO)	The Grain and Flour Mill Organization (GFMO)
Commercial production of plants	Ministry of Electricity and Water
The Ministry of Education	The Ministry of Education
Wild Life Saudi Commission	Wild Life Saudi Commission
Research centers and laboratories	Research centers and laboratories
	Ministry of Defense and Aviation

The Study System at College of Science

Teaching at the College of Science is subject to the following scheme:

1. School year consists mainly of two regular semesters and a summer semester, if available.
2. The stage of academic progress is indicated by the academic level since the number of levels to graduate is at least eight levels in conformity with the approved Study Plan.
3. The duration of the level is a full semester (not less than 15 weeks) and this period does not include the periods of registration and final exams.
4. The duration of the summer semester is not less than eight weeks where the teaching time allocated for each course is doubled.
5. A number of courses (subjects) are taught during each academic level according to the program of each specialty in the different departments.
6. Students have to study 136 class units (credit hours) to obtain a Bachelor's Degree as follows:
 - A. The student studies a number of 31 credit hours during the Preparatory Year (two semesters in one academic year).

B. The student studies 97 credit hours (optional + compulsory) in the Program of Specialization in the various College departments throughout the six semesters following the Preparatory Year (beginning with the third semester).

C. University Requirements: The student selects 8 credit hours of the requirements of the University out of 22 optional credit hours during the period of study at the College.

7. The student chooses the specialty department before the end of the Preparatory Year based on the conditions set by each department.

1. The New Academic System (e-Register)

Registration is the cornerstone of the academic system, the center of the educational process, and the first step to start university life. The new Academic System (e-Register) offers new students the following opportunities:

1. To create an e-mail through the site of the Deanship of Electronic Transactions and Communications:

<http://www.ksu.edu.sa/sites/KSUArabic/Deanships/Computer/Pages/>

2. To have an access to the academic system by using the link: <http://edugate.ksu.edu.sa>; then, entering a user name and a password.

3. **Online Registration** (registration, adding, and dropping): a student can register, in person, from any location during the periods of registration and dropping plus an additional period specified in the academic calendar; thus, without having to visit the College or the Department, the student can perform the following:

A. **Registration:** Registration of courses and deciding the required number of credit hours.

- B. **Adding and dropping:** The student may drop and add courses during the first week of teaching provided that the study load does not go above , or lower than, the allowed course load.
4. To view the course schedule of the College and the available/closed groups.
 5. To view the study schedule and print it.
 6. To view the Academic Record and print a copy (an unofficial copy).
 7. To view the results of the final exams as soon as they are put online.
 8. To view the Study Plan, the courses passed by the student, and the ones remaining to be studied.
 9. To know about the penalties imposed upon the student.
 10. To view the financial rewards.
 11. To make suggestions and submit complaints.
 12. To write the academic performance evaluation of faculty members.
 13. To exchange electronic messages and change the password.
- * In case of any problem while registering, please consult the College Registration Office (room 1 a 7 - Building 4).

2. Rules and Mechanisms for Registration of Courses

- **The Course** is a module that meets the needs of the level specified in the approved Study Plan in each specialty (Program). The Course has a number, a code, a title, and a description depending on the different departments (see the Department's Manual Guide).
- **The Course** is divided into a set of theoretical lectures and practical lessons (study units) taught weekly during the academic level.
- **The Credit Hour** is a weekly theoretical lecture that is not less than fifty minutes, or a practical lesson which is not less than one hundred minutes.
- The registration of the courses for all students is done automatically through the website: <http://edugate.ksu.edu.sa>

- The academic levels vary in the number of the units of study, from 12 units to 20 units, for each level.
- The Courses are registered automatically at the beginning of the following semester for the student's convenience. Then, the student can modify the course schedule by adding or dropping.
- The following table shows the student's study load corresponding to the cumulative average:

GPA	2	2.5	3	3.5	4	4.5	5
Hours allowed for registration	14	15	16	17	18	19	20

- **The Processes of dropping and adding** are performed by the student electronically in the first week of the semester through accessing the gate of the academic system of the University Deanship of Admission and Registration (<http://edugate.ksu.edu.sa>).
- No student has the right to register a course without passing its pre-requisite course.
- Students, who pass all courses without failures, are registered in the courses of the level beginning gradually with the lower levels according to the study plans approved.
- Students, who fail in some courses, are registered in courses that ensure their minimum study load in each semester taking into account the following points:
 - No conflict in the course study schedule.
 - Satisfying the previous requirements of the course or courses to be registered.

Calculating the Average and Cumulative GPA:

The Average and cumulative GPA are calculated every semester for the student automatically by the system. To know how to calculate the averages, you should follow the following steps:

Calculating the Semester Average:

The GPA is calculated considering the following points:

1. Knowing the number of hours of the courses.
2. knowing the mark obtained in each course.
3. Knowing the corresponding grade of each mark.
4. Knowing the value of each grade.
5. Knowing the points = number of hours of the course × value of the grade.
6. Determining the total points obtained in all courses of the semester.
7. Determining the total number of hours registered in the semester.
8. The average is calculated every semester according to the following equation:

$$\text{GPA} = \frac{\text{Total points (item 6)}}{\text{Number of hours registered in the semester (item 7)}}$$

The following table shows the percentage of marks, grade and value obtained by the student in each course, which is used to calculate the points:

Mark	Grade	Letter of Grade	Value of Grade
From 95-100	Excellent +	A+	5.00
From 90 to less than 95	Excellent	A	4.75
From 85 to less than 90	Very Good+	B+	4.50
From 80 to less than 85	Very Good	B	4.00
From 75 to less than 80	Good +	C+	3.50
From 70 to less than 75	Good	C	3.00
From 65 to less than 70	Pass +	D+	2.5
From 60 to less than 65	Pass	D	2.00
Less than 60	Failure	E	1.00
Absence from lectures (25% or more)	Debarred	H	1.00

Calculating the Average Cumulative:

The GPA semester average is calculated as follows:

- 1) The grand total of points (for all semesters that have been studied).
- 2) The grand total of credit hours (for all semesters that have been studied).
- 3) The cumulative average is calculated according to the following equation:

$$\text{GPA} = \frac{\text{Grand total of points}}{\text{Grand total of credit hours}}$$

Here is an example of how to calculate the grades above:

Calculating the grade of the first semester:

Course	Credit Hours	Mark	Grade	Grade Value	Points
Phys 101	4	67	D+	2.5	$4 \times 2.5 = 10$
Chem101	4	73	C	3	$4 \times 3 = 12$
Eng 121	3	77	C+	3.5	$3 \times 3.5 = 10.5$
Arab 101	2	81	B	4	$2 \times 4 = 8$
	13				40.5
GPA = Total points ÷ No. of hours registered in semester = $40.5 \div 13 = 3.12$					

Calculating the grade of the second semester:

Course	Credit Hours	Mark	Grade	Grade Value	Points
Math 101	3	61	D	2	$3 \times 2 = 6$
Stat 101	3	73	C	3	$3 \times 3 = 9$
Computer Science 206	3	80	B	4	$3 \times 4 = 12$
Arab 103	3	88	B+	4.5	$3 \times 4.5 = 13.5$
Islam 101	2	92	A	4.75	$2 \times 4.75 = 9.5$
Eng 122	3	97	A+	5	$3 \times 5 = 15$
	17				65
GPA = Total points ÷ No. of hours registered in semester = $65 \div 17 = 3.82$					

Calculating the average cumulative:

$$\text{GPA} = \text{Total points} \div \text{Total hours of the semester} = 105.5 \div 30 = 3.52$$

Dropping and adding of a course:

- The process of dropping and adding is performed through portal (<http://edugate.ksu.edu.sa>) during **the first week of the semester only**; but the number of credit hours registered has to be at least 12 hours.
- The student may drop only one course due to an excuse acceptable to the Dean

of the College. This procedure should occur at least five weeks before the final exams begin. The student has the right to apply for such a procedure at a maximum of four courses during the whole period of study at the College.

Attendance, postponing and dropping out of College:

- The student must be regular in attendance attending at least 75% of the lectures and the practical classes.
- If any student has a percentage of absence of 25%, or more, in any course, he is denied access to the final exam of this course and his result is F.
- A student may apply for postponement of the study before the beginning of the semester for an excuse accepted by the College Board. The postponement should not exceed two consecutive semesters or three intermittent semesters as a maximum limit while studying at the College.
- The University Council may, in case of necessity, exempt the applicant from the previous provision.
- If a student drops out of College for one semester without requesting the postponement of his registration, the University has the right to dismiss his registration. The University Council has the right to do this for a lesser period of time.
- The student is not considered as dropping out of College if he is a visiting student at another university.

Visiting Student

The Visiting Student is a student who studies some courses at another university, or at a branch of the university to which he belongs without being transferred. The courses he studied are accredited according to the following regulations:

- The student has to have a transcript (including a grade point average) for, at least, two semesters at his college before he applies as a visiting student.
- The student must obtain a prior approval from his college permitting him to study as a visiting student while specifying the courses that will be studied. The College has the right to require a specific grade to be achieved by the student to offset the

course. The student should obtain an official letter from the Deanship of Admission and Registration directing him to study as a visiting student.

- The student has to join a college or a university officially recognized.
- The courses, under consideration by the student to be studied outside the University, must be equivalent in their description to the University courses, and their course units should be no less than the units of any of the courses contained in the graduation requirements.
- The maximum of the total units of study that can be calculated from outside the University is twenty percent (20%) of the total units required for graduation at King Saud University.
- The courses that are studied by the visiting student are not included in the cumulative average. These courses are recorded in his academic record.
- The student must provide the Deanship of Admission and Registration with the results he obtained during the first two weeks of study in the semester following the period of study as a visitor. If not reported within that period, the student is considered as dropping out of College during those semesters.

Dismissal from the University:

The student is dismissed from the University in the following cases:

- If he receives three consecutive warnings due to a cumulative average below a minimum of 2.
- The student may be given a fourth opportunity by the Council of the University based upon the recommendation of the College Council to raise his cumulative GPA by studying the available courses.
- The University Council may give the dismissed students, due to warnings, an opportunity that does not exceed two semesters as a maximum.
- If the student does not fulfill his graduation requirements at the College in a period of up to half of the period prescribed for graduation in addition to the duration of the Program.

- The student is given an exceptional opportunity by the University Council to meet the graduation requirements during a maximum period not exceeding twice the original term specified for graduation.
- The University Council may allow dismissed students, due to the exhaustion of failure times, to attend twice the duration of the Program. This extension should not exceed a maximum of two semesters.

Examinations and Grades:

- Based on a proposal from the Department Council, the College Council specifies a mark for the student's semester work, varying from 40% to 60% of the final grade of the course.
- The mark of the course's semester work is calculated by one of the following two methods:
 - Oral, practical tests, research, or other forms of classroom activity, or from all the above or some of them, in addition to at least one written exam.
 - Two written exams at least.
- Based on the recommendation of the course teacher, it is permissible for the Council of the Department, that teaches the course, to allow the student to complete the requirements of any course in the following semester and to give the student a grade of I (incomplete) in his academic record. Only the grades achieved by the student are included in the GPA or cumulative after the completion of the requirements of that course.
- If one semester passes without changing the grade incomplete (I), the student is given an F which is calculated in the GPA and cumulative.
- The grades obtained by the student in each course are calculated according to the schedule mentioned above.

Restrictions of the Final Examinations:

- No student may be tested in more than two courses in one day.
- The student is not allowed to enter the final exam after half an hour of its

beginning, and is not allowed to leave the exam room before half an hour after its beginning.

- Based on a recommendation from the relevant Department Council, the College Council specifies the duration of the final written exam to be within a period not less than one hour, and not more than three hours.
- Cheating in the exam, initiating it, or violating the instructions and rules of examination procedures are actions punishable in accordance with the Regulations of the Students' Discipline issued by the University Council.
- In cases of necessity, the College Council, in charge of teaching a course, has the right to approve re-marking of the answer sheets in a period of time not later than the beginning of the following semester in accordance with the following rules:
 - A student may apply for re-marking the answer sheets of only one course per semester.
 - The student, who wishes to re-mark his answer sheets, may apply for re-marking to the department that teaches this course, not later than one month after taking the final exam.
 - A student, who has already applied for re-marking and proved the invalidity of his application, should never apply for re-marking his answer sheets in any exam in the future.

Transferring:

1) Transferring from one college to another within the University:

- It is permissible, with the consent of the respective deans of the colleges, to transfer from one college to another in accordance with the conditions approved by the College Council to which the student wishes to transfer.
- The student's college academic record has to show all courses previously studied, including grades, semester and cumulative averages throughout the study at the college from which he is transferred.

2) Transferring from one major to another within the College:

- The student may, after the approval of the Dean, transfer to another specialty within the College according to the guidelines established by the College Council.
- The student's college academic record has to show all courses previously studied, including grades, semester and cumulative averages throughout the study at the college from which he is transferred.

Graduation:

The student graduates after completing successfully the graduation requirements in accordance with the study plan, provided that his cumulative average is no less than 2 (Pass) .

Admission Requirements for the B· Sc· Program:

Under the terms of admission to the College of Science, the Botany & Microbiology Department stipulates the following conditions:

1. The student must hold a Secondary School Certificate (Natural Sciences Section).
2. The average, scored by the student in the High School Examination, should be no less than 75% (weighted percentage).
3. The student's cumulative average must not to be less than 2.5 out of 5, when transferring to the Department.
4. A full-time registration is required.

Admission Requirements for the M· Sc· Program:

- 1- The admission requirements stipulated in the Unified Graduate Studies Statutes for Saudi universities.
- 2- The candidate should hold a Bachelor's Degree (B.Sc.) in Botany or Microbiology from King Saud University or an equivalent degree with a grade not less than C (good).
- 3- The candidate must pass a test and a personal interview.
- 4- The candidate must have the approval of the employer.
- 5- The admission is for full- time registration.
- 6 – The candidate must pass any supplementary courses deemed necessary by the Department's Council.

Admission Requirements for the Ph· D· Degree:

- 1-The admission requirements stipulated in the Unified Graduate Studies Regulations for Saudi universities.

- 2- The candidate should hold a Master's Degree in Botany or Microbiology from King Saud University or an equivalent degree.
- 3- The candidate must pass a test and a personal interview as prescribed by the Department.
- 4- The candidate must have obtained at least a score of 450 in the Test of English as a Foreign Language (TOEFL), or score of not less than 4.5 in the International English Language Testing System (IELTS), in addition to passing the Academic Reading and Writing Modules.
- 5- The candidate must have the approval of the employer.
- 6- Admission is for full - time registration.
- 7- The candidate must pass any supplementary courses deemed necessary by the Department's Council.

The Study Plan for the Bachelor's Degree (B· Sc· Botany)

Description of the Study Plan (B· Sc· Botany):

The Plan contains (136 study units) spread over eight semesters and a summer semester as follows:

- (1) The Preparatory Year (31 units).
- (2) The Remaining University Requirements (8 Units).
- (3) Compulsory Requirements from Botany (59Units).
- (4) Compulsory Requirements outside Botany (23 Units).
- (5) Elective Requirements from Botany (6Units).
- (6) Elective Requirements outside Botany (9 Units).

Total	(136 Units)
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General structure of the B· Sc· Degree Program in Botany

Requirements	Course Designation & Title	Credit hours
Preparatory Year Requirements	Eng 140: English Language skills (1)	8
	Eng 150: English Language skills (2)	8
	Math 140: Introduction to Mathematics	2
	Math 150: Differential Calculus	3
	CT 140: Computer skills	3
	CHS 150: Health & Fitness	1
	CI 140: Learning, Thinking & Research Skills	2
	SDS 150: Communication Skills	2
	ENT 101: Entrepreneurship	1
	Total	31 Units
Remaining University Requirements (Only 8 Units)	IC 101: Islamic Culture	2
	IC 102: Islam & Society	2
	IC 103: Economic system in Islam	2
	IC 104: Political system in Islam	2

	Total	8 Units
Compulsory Requirements from Botany		59 Units
Compulsory Requirements outside Botany		23 Units
Elective Requirements from Botany		6 Units
Elective Requirements outside Botany		9 Units
Total		136 Units

Compulsory Requirements from Botany

No. & SYMBOL	Course Title	Units
Bot 102	Botany	3 (2+1)
Bot 212	Plant Anatomy	4 (2+2)
Bot 213	Plant Microtechnique	2 (1+1)
Bot 222	Principles of Flowering Plants Taxonomy	3 (2+1)
Bot 241	Plant Ecological Factors	3 (2+1)
Bot 251	Cell Biology & Cytogenetics	3 (2+1)
Bot 253	Genetics	4 (3+1)
Bot 271	General Plant Physiology	4 (3+1)
Bot 345	Flora of Saudi Arabia	2 (1+1)
Bot 346	Pollution and Environmental Protection	2 (1+1)
Bot 349	Ecophysiology	2 (1+1)
Bot 358	Plant Molecular Genetics	3 (2+1)
Bot 359	Population Genetics	2 (1+1)
Bot 373	Plant Growth and its Regulators	2 (1+1)
Bot 384	Phycology	3(2+1)
Bot 440	Plant Communities	2 (1+1)
Bot 442	Hot Desert Ecology	1 (1+0)
Bot 444	Ecological Resources	2 (1+1)
Bot 472	Plant Tissue Culture	2 (1+1)
Bot 473	Plant Chemistry	2 (1+1)
Bot 491	Field Studies in Ecology and Algae	5 (0+5)
Bot 498	Research Project	3 (0+3)
Total		59

Elective Requirements from Botany (6 Units)

No. & SYMBOL	Course Title	Units
Bot 263	Archegoniates	2 (1+1)
Bot 312	Plant Morphogenesis	2 (2+0)

Bot 322	Experimental Taxonomy	2 (1+1)
Bot 332	Seminar	1 (0+1)
Bot 341	Ecosystems	1 (0+1)
Bot 347	Plant Geography	2 (2+0)
Bot 379	Metabolism & Transport in Plants	2 (1+1)
Bot 380	Plant Water & Soil Relations	2 (1+1)
Bot 446	Management of Natural Resources and Conservation	2 (2+0)
Bot 447	Arid Regions Development	2 (1+1)
Bot 456	Gene Conservation	2 (1+1)
Bot 457	Genetic Engineering	2 (1+1)
Bot 458	Ecological Genetics	2 (1+1)
Bot 476	Date Palm Biology	2 (1+1)
Bot 487	Phytoplankton	2 (1+1)

Courses Taught in English:

- 1- Bot 102 General Botany.
- 2- Bot 213 Plant Microtechnique.
- 3- Bot 222 Principals of Flowering Plants Taxonomy.
- 4- Bot 251 Cell Biology & Cytogenetics.
- 5- Bot 253 Genetics.
- 6- Bot 271 General Plant Physiology.
- 7- Bot 346 Pollution and Environmental Protection.
- 8- Bot 384 Phycology.
- 9- Bot 358 Plant Molecular Genetics.
- 10- Bot 446 Management of Natural Resources and Conservation (Botany)

Compulsory Requirements from outside Botany

No. & SYMBOL	Course Title	Units
Chem 103	General Chemistry	3 (3+0)
Chem 104	General Chemistry Practical	1 (0+1)
Zoo 103	Principles of Zoology	3 (2+1)
Stat 106	Biostatistics	2 (1+1)
Mic 140	Microbiology	3 (2+1)
Phys 209	Physics	3 (3+0)
PhG. 222	Pharmacognosy 1	3 (2+1)
302 Geo	Industry & Environment	2 (2+0)
Geo 303	Principles of Remote Sensing	3 (2+1)
Total		23 Units

Elective Requirements outside Botany (9 Units From one Group)

Group (A): Microbiology

Group (B): Biology

Course	Course Title	Credit Hours
Mic 240	Lab. skills	2(0+2)
Mic 250	Virology	3(2+1)
Mic 251	Molecular Biology	2(1+1)
Mic 260	Bacteriology	3(2+1)
Mic 270	Mycology	3(2+1)
MIC 330	Microbial Physiology.	3(2+1)
Mic 344	W. & S. Micobiology	2(1+1)
Mic 465	Industrial Micro.	2(1+1)
Mic 463	Antibiotics	2(1+1)

Course	Course Title	Credit Hours
Zoo 212	Parasitology	3(2+1)
Zoo 311	General Entomology	3(2+1)
Zoo 320	Ichthyology	2(1+1)
Zoo 327	Amphibians & Reptiles	3(2+1)
Zoo 325	Ornithology	3(2+1)
Zoo 326	Mammology	2(1+1)
Zoo 373	Land Ecology	2(1+1)
Zoo 374	Aquatic Ecology	2(1+1)
Zoo 432	Endocrinology	2(1+1)
Geo 262	Geoecology	2(2+0)

Semester-wise Study Plan (B. Sc. Botany)

Preparatory Year (1st and 2nd Semester)

Course Designation	Course Title	Credits
ELS. 140	English Languish (1)	8
ELS150	English Languish (2)	8
MS140	Introduction to Math. (1)	2
MS150	Math. (2): Differential Calculus	3
CT. 140	Computer Skills	3
CI 140	Learning, Thinking & Research Skills	3
CHS 150	Health & Fitness	1
MC 150	Communication Skills	2
ENT101	Entrepreneurship	1
TOTAL		31

Third level (16 units)

SYMBOL &No.	Course Title	Corequisite	Prerequisite	Credit Hours
IC	University Requirement	None	None	2 (..+..)
Bot 102	Botany (In English)	None	None	3 (2+1)
Zoo 103	Principles of Zoology	None	None	3 (2+1)
MBio 140	General Microbiology	None	None	3 (2+1)
Bot 222	Principles of Flowering Plants Taxonomy (In English)	None	BOT 102	3 (2+1)
Bot	Elective in Botany	None	None	2 (..+..)

Fourth Level (19 Units)

SYMBOL &No.	Course Title	Corequisite	Prerequisite	Credit Hours
IC	University Requirement	None	None	2 (..+..)
Chem 103	General Chemistry	None	None	3 (3+0)
Chem 104	General Chemistry practical	None	None	1 (0+1)
Bot 212	Plant Anatomy	BOT 102	None	4 (2+2)
Bot 213	Microtechniques (In English)	BOT 102	None	2 (1+1)
Bot 241	Plant Ecological Factors	None	None	3 (2+1)
Bot 271	Plant physiology (In English)	BOT 102	None	4 (2+2)

Fifth Level (17 Units)

SYMBOL &No.	Course Title	Corequisite	Prerequisite	Credit Hours
.....	University Requirements	None	None	2 (..+..)
Bot 251	Cell Biology & Cytogenetic (In English)	None		4 (3+1)
Bot 253	Genetics(In English)	BOT 251		3 (2+1)
Bot 345	Flora of saudi Arabia	BOT 251		2 (1+1)
Bot 346	pollution and Environmental protection	BOT 241		2 (1+1)
Bot 348	Ecophysiology	BOT 241& BOT 271		2 (1+1)
Bot	Elective in Botany			2 (..+..)

Sixth Level (17 Units)

SYMBOL &No.	Course Title	Corequisite	Prerequisite	Credit Hours
.....	University Requirement	None	None	2 (..+..)
Stat 106	Biostatistics	None	None	2 (1+1)
Bot 374	Plant Growth and its Regulators	BOT 271	None	2 (1+1)
Bot 384	Phycology (In English)	BOT 102	None	3 (2+1)
Bot 441	Plant Communities	BOT 241	None	2 (1+1)
Bot 442	Hot Desert Ecology	BOT 241	None	1 (1+0)
PhG 222	Pharmacognosy 1	None	None	3 (2+1)
Bot	Elective in Botany		None	2 (..+..)

Seventh Level (15 Units)

SYMBOL &No.	Course Title	Corequisite	Prerequisite	Credit Hours
PHYS 209	Biophysics	None	None	3 (3+0)
Geo 303	Principles of Remote Sensing	None	None	3 (2+1)
Bot 444	Ecological Resources	BOT 241	None	2 (1+1)
-----	Elective From Group (A) or (B)		None	2 (..+..)
-----	Elective From Group (A) or (B)		None	2 (..+..)
Bot 498	Research Project	BOT 102	None	3 (0+3)

Summer Semester (5 Units)

SYMBOL &No.	Course Title	Co-	Prerequisite	Credit Hours
Bot 491	Field Studies in Ecology and Algae	BOT 102	None	5 (0+5)

Eighth Level (16 Units)

SYMBOL &No.	Course Title	Corequisite	Prerequisite	Credit Hours
Geo 302	Industry & Environment	None	None	2 (2+0)
Bot 358	Plant Molecular Genetics (in English)	None	None	3 (2+1)
Bot 359	Population Genetics	Bot 253	None	2 (1+1)

Bot 472	Plant Tissue Culture	Bot 251 & Bot 271	None	2 (1+1)
Bot 473	Plant Chemistry	BOT 271	None	2 (1+1)
-----	Elective From Group (A) or (B)		None	2(..+..)
-----	Elective From Group (A) or (B)		None	3 (...+..)

The Study Plan for the Bachelor's Degree (B. Sc. Microbiology)

Description of the Study Plan (B. Sc. Microbiology):

The Plan contains (136 unit) in Microbiology spread over eight semesters and a summer semester as follows:

Requirements	No. Of Courses	Credits
Preparatory Year	9	31
University Requirements	4	8
Compulsory Requirements from Microbiology	23	65
Compulsory Requirements from outside the	5	13
Elective Requirements in Microbiology	8	12
Elective Requirements from outside the Department	6	5
Free Courses	1	2
TOTAL	57	136

General structure of B. Sc. Degree Program In Microbiology

Requirements	Course Designation & Title	Credit Hours
Preparatory Year	ELS 140.English Languish (1)	8
	ELS 150 .English Languish l (2)	8
	Ms. 140 Introduction to Mathematics (1)	2
	Ms. 150 Math. (2): Differential Calculus	3
	CT 140 Computer Skills	3
	CI 140 Learning, Thinking & Research	3
	CHS 150 Health & Fitness	1
	MC 150 Communication Skills	2
	ENT101 Entrepreneurship	1
	Total	31
Remaining University Requirements (8)	IC 101 Islamic Culture	2
	IC 102 Islam & Society	2
	IC 103 Economic System in Islam	2
	IC 104 Political System in Islam	2
	Required Credits	8
Compulsory Requirements from Microbiology		65
Compulsory Requirements from outside the		13
	No. Of Credit Hours	17

Elective Requirements in Microbiology	Required Credits	12
	No. Of Credit Hours	15
Elective Requirements From outside the department	Required Credits	5
Free courses		2
TOTAL		136

Preparatory Year (1st and 2nd Semester)

Course Designation	Course Title	Credits
ELS 140	English Language (1)	8
ELS 150	English Language (2)	8
MS 140	Introduction to Math. (1)	2
MS 150	Math. (2): Differential Calculus	3
CT 140	Computer Skills	3
CI 140	Learning, Thinking, Research Skills	3
CHS 150	Health & Fitness	1
MC 150	Communication Skills	2
ENT 101	Entrepreneurship	1
TOTAL		31

University Requirements

Course Designation	Course Title	Credits
IC 101	Islamic Culture	2
IC 102	Islam & Society	2
IC 103	Economic System in Islam	2
IC 104	Political System in Islam	2
Required Credit		8

Detailed Program Structure of the Bachelor's Degree in Microbiology

Requirements	Course Designation & Title	Prerequisite Course	Corequisite Course	Credit hours
Compulsory Requirements	MBio 140. General Microbiology	None	None	3 (2+1)
	MBio 240. Laboratory Skills	MBio. 140	None	2 (0+2)
	MBio. 250 General Virology	MBio. 140	None	3 (2+1)
	MBio. 260 General Bacteriology	MBio. 140	None	3 (2+1)
	MBio. 270 General Mycology	MBio. 140	None	3 (2+1)
	MBio. 280 Biology of Microbiology	MBio. 140	None	2 (1+1)
	MBio. 320 Microbiology Diagnosis	MBio.240 250., 260.,270	None	2 (1+1)
	MBio 330. Microbial Physiology	MBio240250.,260.,270.,	MBio.280	3 (2+1)
	MBio. 334 Biochemical instrumentation Techniques	MBio250.,260.,270.,280	None	2 (1+1)
	MBio. 340 Microbial Ecology & Pollution	MBio. 250,260.,270.,	MBio.280	3 (2+1)
	MBio. 344 Water Sanitation Microbiology	MBio. 340	None	2 (1+1)
	MBio. 351 Microbial Genetic	MBio250.,260.,270 ,280	None	3 (2+1)
MBio 362. Microbial I Fine Structure	MBio250.,260.,270 ,280	None	2 (1+1)	

<i>Requirements</i>	<i>Course Designation & Title</i>	<i>Prerequisite Course</i>	<i>Corequisite Course</i>	<i>Credit hours</i>
From Microbiology	MBio 450. Medical Virology	MBio. 250	None	3 (2+1)
	MBio. 460 Medical Bacteriology	MBio. 260	None	3 (2+1)
	MBio. 470 Medical Mycology	MBio. 270	None	3 (2+1)
	MBio. 451 Immunology	MBio. 351	None	3 (2+1)
	MBio. 465 Industrial Microbiology	FSN 321, MBio280	None	2 (1+1)
	MBio. 466 Introduction to Petroleum Microbiology	MBio340,344	None	2 (1+1)
	MBio. 490 Scientific Communication	After 6 th semester	None	1 (1+0)
	MBio491. Laboratory Applied Training in Microbiology I	MBio 344&465	None	6 (0+6)
	MBio. 492 Laboratory Applied Training in Microbiology II	MBio., 450.,460 ,470 451,490&491	None	6 (0+6)
	MBio. 499 Research Project	MBio. 450.,460, 470.,451., 491	MBio. 492	3 (0+3)
	No. OF CREDIT HOURS			65
Compulsory Requirements From outside the Department	Chm103.General Chemistry	None	Chem. 107	3 (3+0)
	Chem107.Practical General Chemistry	None	Chem. 103	1 (0+1)
	BCH 101 General Biochemistry	None	None	4 (3+1)
	STAT 106 Biostatistics	None	None	2 (1+1)
	FSN 321 Food Microbiology	MBio. 260,270	MBio.280	3 (2+1)
	No. OF CREDIT HOURS			13
Elective Requirements from Microbiology	MBio. 251 Molecular Biology	<i>MBio.140</i>	None	2 (1+1)
	MBio. 335Biodegradation	MBio. 140	None	2 (1+1)
	MBio. 345Microbial Interactions	MBio. 140	None	2 (1+1)
	MBio 346. Mining Microbiology	MBio. 140	None	2 (1+1)
	MBio. 348 Lichenology	MBio. 140	None	2 (1+1)
	MBio. 349 Yeast	MBio. 140	None	2 (1+1)
	MBio. 487 Plankton	MBio. 140	None	2 (1+1)
	MBio. 463 Antibiotics	MBio. 140	None	3 (2+1)
	No. OF CREDIT HOURS			17
	No. OF REQUIRED CREDIT			12
Elective Requirements From outside the Department	Bot 102. Botany	None	None	3 (2+1)
	Zoo. 103 Principles of General Zoology	None	None	3 (2+1)
	Chem 106. Organic Chemistry	None	None	2 (2+0)
	Phys. 209 Biophysics	None	None	3 (2+1)
	Chem. 253 Analytical Chemistry	Chem. 103	None	2 (1+1)
	Zoo 262 Electron and Light Microscope	Zoo. 103	None	2 (1+1)
		No. OF CREDIT HOURS		
	No. OF REQUIRED CREDIT			5
Free courses		None	None	2
	TOTAL			97

Service Courses

Course Designation	Course Title	Credit	Benefiting Department
MBio. 140	General Microbiology	3 (2+1)	Botany, Zoology, Biochemistry
MBio. 240	Laboratory Skills	2 (0+2)	Botany, Zoology
MBio. 250	General Virology	3 (2+1)	Botany, Zoology
MBio. 260	General Bacteriology	3 (2+1)	Botany, Zoology
MBio.270	General Mycology	3 (2+1)	Botany, Zoology
MBio. 280	Biology Of Micro-algae	2 (1+1)	Botany, Zoology
MBio. 320	Microbial Diagnosis	2 (1+1)	Botany
MBio. 340	Microbial Ecology& Pollution	3 (2+1)	Botany, Zoology
MBio. 344	Sanitation and Water Microbiology	2 (1+1)	Botany, Zoology
MBio. 346	Mining Microbiology	2 (1+1)	Botany, Zoology
MBio. 348	Lichenology	2 (1+1)	Botany, Zoology
MBio. 381	Plankton	2 (1+1)	Botany, Zoology
MBio. 450	Medical Virology	3 (2+1)	Biochemistry
MBio. 460	Medical Bacteriology	3 (2+1)	Biochemistry
MBio. 465	Industrial Microbiology	2 (1+1)	Botany
MBio. 463	Antibiotics	3 (2+1)	Botany
TOTAL		40	

Courses Taught in English*

Course Designation	Course Title	Credit	College/Department
MBio. 140	General	3 (2+1)	Botany & Microbiology
MBio. 240	Laboratory Skill	2 (0+2)	Botany & Microbiology
MBio. 320	Microbial	2 (1+1)	
MBio. 334	Biochemical Instrumentation	2 (1+1)	Botany & Microbiology
MBio. 362	Microbial Fine	2 (1+1)	Botany & Microbiology
MBio. 450	Medical Virology	3 (2+1)	Botany & Microbiology
MBio. 460	Medical	3 (2+1)	Botany & Microbiology
MBio. 470	Medical	3 (2+1)	Botany & Microbiology
MBio. 451	Immunology	3 (2+1)	Botany & Microbiology
MBio. 490	Scientific Communication	1 (1+0)	Botany & Microbiology
MBio. 491	Laboratory Applied Training in Microbiology I	6 (0+6)	Botany & Microbiology/well established lab. e.g. Sewage and Water Treatments Plants, Food Safety, Municipality, Saudi Arabian Standards Organization
MBio. 492	Laboratory Applied Training in	6 (0+6)	Botany & Microbiology / University hospitals
MBio. 499	Research Project	3 (0+3)	Botany & Microbiology
TOTAL Credit		39	

*40.2% of the total credit units

Semester-wise Study Plan (B. Sc. Microbiology)

Preparatory Year (1st and 2nd Semester)

Course Designation	Course Name	Prerequisite Course	Corequisite Course	Credits
ELS.140	English Language (1)	None	None	8
ELS 150	English Language (2)	ELS 140	None	8
MS 140	Introduction to	None	None	2
MS 150	Differential Calculus (2)	MS 140	None	3
CT. 140	Computer Skills	None	None	3
CI 140	Learning, Thinking & Research Skills	None	None	3
CHS 150	Health & Fitness	None	None	1
MC 150	Communication Skills	None	None	2
ENT 101	Entrepreneurship	None	None	1
TOTAL				31

3rd Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
IC 101	Islam & Culture	None	None	2(2+0)
Chem. 103	General	None	Chem107	3(3+0)
Chem107	Practical General Chemistry	None	Chem. 103	1(0+1)
BCH. 101	General	None	None	4 (3+1)
MBio. 140	General	None	None	3 (2+1)
STAT. 106	Biostatistics	None	None	2 (1+1)
Elective		None	None	3
TOTAL				18

4th Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
IC 102	Islam & Society	IC 101	None	2 (2+0)
MBio. 240	Laboratory	MBio.140	None	2 (0+2)
MBio 250	General	MBio.140		3 (2+1)
MBio. 260	General	MBio.140	None	3 (2+1)
MBio. 270	General	MBio.140	None	3 (2+1)
Elective		None	None	4
TOTAL				17

5th Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
IC 103	Economic System in Islam	IC102	None	2 (2+0)
MBio. 280	Biology of Micro-algae	MBio.140	None	2 (1+1)
FSN 321	Food	MBio.260&270	None	3 (2+1)
MBio. 330	Microbial Physiology	MBio.240.250.260,&270	MBio 280	3 (2+1)
MBio. 340	Microbial Ecology&Pollution	MBio250m260,&270	MBio 280	3 (2+1)
Elective		None	None	4
TOTAL				17

6th Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
IC104	Political System in Islam	IC 103	None	2 (2+0)
MBio. 320	Microbial Diagnosis	MBio.240,250,260&,270	None	2 (1+1)
MBio.. 334	Biochemical Techniques	MBio 250,260,270&280	None	2 (1+1)
MBio. 344	Sanitation and Water Microbiology	MB io340	None	2 (1+1)
MBio. 351	Microbial Genetics	MBio 250,260&270,280	None	3 (2+1)
MBio. 362	Microbial fine structure	MBio250,260,270.	None	2 (1+1)
MBio. 465	Industrial Microbiology	FSN321,MBio,280	None	2 (1+1)
Elective				2
TOTAL				17

Summer Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
MBio. 491	Laboratory Applied Training in Microbiology I	MBio. 344&465	None	6 (0+6)
TOTAL				6

7th Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
MBio. 466	Introduction to Petroleum Microbiology	MBio.340 &344	None	2 (1+1)
MBio. 451	Immunology	MBio.351	None	3 (2+1)
MBio. 450	Medical Virology	MBio250	None	3 (2+1)
MBio. 460	Medical	MBio.260	None	3 (2+1)
MBio. 470	Medical Mycology	MBio.270	None	3 (2+1)
MBio.. 490	Scientific Communication	After 6 th Semester	None	1 (1+0)
TOTAL				15

8th Semester

Course Designation	Course Title	Prerequisite Course	Corequisite Course	Credit
. Free course		None	None	2
Elective				4
MBio. 492	Laboratory Applied Training in Microbiology II	MBio., 450.,460 ,470 ,451,490,491	None	6 (0+6)
MBio499	Research Project	MBio.450.460.470. 451, &491	MBio. 492	3 (0+3)
TOTAL				15

Master's Programs

BOTANY:

Level (Semester) I			Level (Semester) II		
Symbol	Course	Number of Units	Symbol	Course	Number of Units
512 BOT.	Plant Surfaces	2(1+1)	514 BOT.	Applied Plant Anatomy	2(1+1)
521 BOT.	Classification of Developed Flowering Plants	2(1+1)	523 BOT.	Field Taxonomy	2(1+1)
541 BOT.	Advanced Ecology	2(1+1)	543 BOT.	Desertification and Conservation of Natural Resources	2(2+0)
551 BOT.	Advanced Genetics	2(1+1)	572 BOT.	Mineral Nutrition	3(2+1)
571 BOT.	Ecological Construction	2(2+0)	591 BOT.	Specialized Topics	1(1+0)
		10			10
Level (Semester) III			Level (Semester) IV		
Symbol	Course	Number of Units	Symbol	Course	Number of Units
553 BOT.	Advanced Cytogenetics	3(2+1)	600 BOT.	Thesis	6(6+0)
592 BOT.	Seminar	1(1+0)			
600 BOT.	Thesis	6(6+0)			
		10 units			

Microbiology

Level (Semester) I			Level (Semester) II		
Symbol	Course	Number of Units	Symbol	Course	Number of Units
511 MIC.	Advanced Virology	2(2+0)	522 MIC.	Mechanism of Bacterial Infection	2(1+1)
521 MIC.	Advanced Bacteriology	2(1+1)	532 MIC.	Mycotoxins	2(1+1)
531 MIC.	Advanced Mycology	2(1+1)	566 MIC.	Microbiological Biotechnology	2(1+1)
561 MIC.	Advanced Microbial Physiology	2(1+1)	572 MIC.	Biology of Prokaryotic Algae	2(1+1)
571 MIC.	Advanced studies in Micro-algae	2(1+1)	591 MIC.	Specialized Topics	2(2+0)
		10 units			10 units

Level (Semester) III			Level (Semester) IV		
Symbol	Course	Number of Units	Symbol	Course	Number of Units
555 MIC.	Microbial Molecular Genetics	3(2+1)	600 MIC.	Thesis	6(0+6)
592 MIC.	Seminar	1(1+0)			
600 MIC.	Thesis	6(0+6)			
		10 units			

Doctoral Programs

The student is directed by the Department to study 9 units selected from the courses mentioned below in accordance with his specialization. The specializations are: Plant Physiology, Ecology, and Genetics:

BOTANY

Level (Semester) I			Level (Semester) II		
Symbol	Course	Number of Units	Symbol	Course	Number of Units
611 BOT.	Advanced Plant Anatomy	2(2+0)	621 BOT.	Advanced Plant Classification	2(1+1)
641 BOT.	Basic features of the Kingdom's environments and flora	2(2+0)	642 BOT.	Seed Ecology	2(1+1)
651 BOT.	Gene Expression and Differentiation	2(2+0)	652 BOT.	Genetic Engineering	2(2+0)
671 BOT.	Advanced Physiological Stresses	2(2+0)	672 BOT.	Advanced Studies in Plant Growth Regulators	3(2+1)
691 BOT.	Seminar	1(1+0)	672 BOT.	Plant Cell Metabolism	1(1+0)

Level (Semester) I		Level (Semester) II		
		674 BOT.	Seed Physiology	2(2+0)
		692 BOT.	Specialized Topics	2(1+1)
		700 BOT.	Thesis	2(2+0)

Microbiology

Level (Semester) I			Level (Semester) II		
Symbol	Course	Number of Units	Symbol	Course	Number of Units
611 MIC.	Molecular Biology of Viruses	2(1+1)	621 MIC.	Technologies and Developments in the Study of Viruses	2(1+1)
621 MIC.	Advanced Studies in Bacteria	2(1+1)	622 MIC.	Advanced Pathogenic Bacteria	2(1+1)
631 MIC.	Biology of Advanced Fungi	2(1+1)	623 MIC.	Antibiotics and Bacterial Plasmids	2(2+0)
671 MIC.	Advanced Topics in Micro-algae	2(2+0)	632 MIC.	Advanced Studies on Parasitism in Fungi	3(2+1)
691 MIC.	Seminar	1(1+0)	633 MIC.	Advanced Studies in Fungi Symbiotic Relationships	1(1+0)
			641 MIC.	advanced Microbiological Environment	
			651 MIC.	Immunology and Vaccines	
			652 MIC.	Techniques in Microbial Molecular Genetics	
			661 MIC.	Biology of Spores	
			662 MIC.	Advanced Medical Microbiology	
			692 MIC.	Specialized Topics	
			700 MIC.	Thesis	

Facilities and equipment

LABORATORIES

The Department of Botany and Microbiology houses more than 20 laboratories for teaching and 28 specialized research laboratories equipped with many modern devices, in addition to several classrooms for lectures.



THE CENTRAL LABORATORY:

The Department's Central Laboratory of includes a set of equipment that can be utilized effectively by all researchers in the Department and others. A group of specialists operate these equipment conducting some tests for research projects for undergraduate students, postgraduates, faculty members and the community at large. This Laboratory falls under the supervision of a specialized committee.

TISSUE CULTURE AND VIRUSES ISOLATION UNIT





Main Objectives of the Central laboratory:

- 1 – To create separate units for the development of biotechnology.
- 2 – To develop the level of scientific research of the postgraduate students.
- 3 - To train the students to meet the demands of the labor market.
- 4 – To transfer modern biotechnology.

Services provided by the Central laboratory:

- 1 – To provide the principal equipment to support research in the Department.
- 2 – To Provide a venue for various tests.
- 3 – To offer training service to students on the equipment.
- 4–To function as means to communication with most of the local and international centers.

The Microscopic Preparations Unit:



The Microscopic Preparations Unit provides services to undergraduate students through the preparation of slides that are taught in some courses. It also extends its services to postgraduate students by preparing samples for their studies. Furthermore, the Unit provides services to the faculty members where they conduct microscopic preparations for their own research.

Students training Unit:

Department of Botany and Microbiology takes training seriously. As mandated by the College of Science, all students have to undergo summer training as a pre-requisite for obtaining B.Sc. degree in any specialization. This period extends over two to three months during the summer vacation. The Training Unit (TU) helps students find suitable training opportunities, or directs them to programs closer to their specialization studies, so as not to conflict between summer training and course work.

The summer training period commences when a student has completed 110 credit hours, grasped basic scientific fundamentals, and acquired a good background in the English language. At the end of the training period, each student submits a training report to be evaluated by the respective academic department.

TU Objectives

- To expose students with the working environment
- To enhance and supplement the knowledge and skills of students
- To develop students in term of ability, competence and interpersonal relationships
- To expose and familiarize the students to rules and regulations including safety in working environment.
- To develop the spirit of team working among students and other working group members.

The Herbarium:





The Herbarium was established in 1385 H, and was registered in the records of lawns World Service in 1409 H. It includes nearly four thousand dried plant samples from the Kingdom identified by their scientific names, tribes, the places from where they were collected and the date of collection. About (5000) types of flowering plants have been collected till now. The Herbarium, together with the Book of Flora which was authored by faculty members, represents an important reference for the Kingdom's plants.

The Botanical Garden:

The Botanical Garden was established in 1413 H in the University Campus containing more than 100 of wild kinds, farm ponds, greenhouses, a water basin, and a warehouse for seeds.



The Botanical Garden, in the Department of Botany and Microbiology, aims at identifying various types of the Kingdom's plants; edible, medical, pastoral, aromatic, and toxic. The Botanical Garden also aims at preserving desert plants threatened with extinction, and allowing researchers and specialists to obtain plant samples and different seeds for various specialized scientific research throughout the year. It may be not known to some people that wild plants can be used as accessories to beautify the gardens and public parks in view of the advantages of those plants given their multiple forms, beautiful flowers and the pleasant scent. Furthermore, these plants are suited to the environmental conditions of the Kingdom which other plants cannot tolerate.

Scientific Societies



The Saudi biological Society was established in 1395 H (1975) and is considered to be the first scientific society to be established in Saudi Arabia. It has the Honorary Presidency of His Royal Highness Prince Sultan bin Abdul Aziz, Crown Prince and Deputy Prime Minister and Minister of Defense and Aviation and General Inspector, and it is located in King Saud University. The University oversees the activities of the Society and supports it financially and morally to achieve its mission. The Society is linked directly to His Excellency the Rector, and membership of the Society is open to scientists and researchers in the biological sciences, especially Saudi nationals. Furthermore, the Society grants honorary membership to those who have excelled in the production of scientific research in life sciences. The Society organizes scientific seminars and conferences attended by specialists from all over the world in different areas of biological Sciences. One of the main objectives of the society is to encourage scientific research and the dissemination of scientific awareness in the areas of biological Sciences.

Board of Directors:

President of the Society	Prof. Ibrahim Bin Abdul Wahid Arif.
Vice-President of the Society	Prof. Samira Omar Saeed Pafeel
Chamberlain	Prof. Ali Bin Hassan Abdel Rahman Bahkali

Society Mission:

The promotion and dissemination of all matters related to biological sciences, and consolidating a closer collaboration among science workers at local, Islamic and international levels.

Society Goals:

- 1) To promote scientific research in the fields of biological sciences in general, and fields related to the local environment in particular.
- 2) Dissemination of scientific awareness, in the fields of biological sciences, through a simplified version of scientific manuals and periodicals in a manner comprehensible to the ordinary citizen.
- 3) To inform the outside world about the scientific research taking place within the scientific institutions in the Kingdom.
- 4) Providing scientific advice, in the areas of its members' specializations, to those who request it within the Kingdom.
- 5) To raise awareness and concern for the preservation of the natural environment in the Kingdom.
- 6) To organize scientific seminars and conferences involving specialists from all over the world to try and find appropriate solutions to the problems of the local environment methods for its development.
- 7) Consolidating the relationship between workers in the field of life sciences and those interested in the biological sciences in the Kingdom, and the organization of excursions and social activities for them inside and outside the Kingdom.

Services provided by the Saudi Biological Society to the public and private sectors and the community:

The Saudi Biological Society provides many services to public and private sectors including:

1. Providing recommendations to public and private sectors to address local environmental and biological problems through seminars and scientific meetings that are held annually and are attended by several specialists in the fields of biological sciences.
2. Providing Counseling, studies and the preparation of research, in the fields of its members' specializations, to institutions of public and private sectors.
3. Encouraging the participations of employees of governmental and private institutions in specialized scientific meetings and discussions to achieve the desired benefit in improving the performance of the work and its development.
4. Presenting the results of studies, research and tests carried out by the Society's members in various scientific fields through publication in the Journal of biological Sciences issued by the Society periodically.
5. The preparation of publications and specialized studies in the following areas:
 - Types of plants that are affected by some of the irrigation methods and the dissemination of some allergens compounds.
 - Types of dates, distribution and inventory of the highest nutrition quality based on its contents.
 - Providing studies, research and publications in the field of water, soil and air pollution.
 - Types of fish and its nutritional benefits.
 - Economically cultivated plants and ways of evaluation in the field of water, soil and air pollution.
 - Providing studies and consultations in the field of desertification.
6. The Society has held several courses, such as:
 - Detection of parasitic worms in water.
 - The use of the electron microscope.
 - Classification of plants and animals.
 - Life studies of different levels of the community, especially in the fields of preservation of natural resources.
7. To identify toxic plants and animals and their dangers.
8. To contribute to research focused on the functions of plant organs and water and heat stresses.
9. To conduct research on tissue culture and the production of economic plant strains.
10. Physiological studies on fruits and seeds after harvesting and during storage and manufacturing.
11. The study of organic and non-organic plant nutrition in opened and protected farms.

12. Evaluating and refereeing scientific research submitted by research centers and universities.
13. The study and definition of micro-organisms (algae - bacteria - fungi - viruses).
14. The assessment of methods used to isolate and purify the bacteria in milk, dairy products and other foodstuffs.
15. Testing new antibiotics and studying its effectiveness.
16. The study of natural phenomena resulting from the products of bacteria such as fire.
17. The role of bacteria, fungi and algae in other industries.
18. The role of bacteria in metal degradation and petrol derivatives.

Address of the Saudi Biological Society;

College of Science, King Saud University - Tel. Box 2455, Riyadh 11451
Kingdom of Saudi Arabia
Tel: 4675838 Fax: 4679983

University Units in the Department

1) Graduate Programs and other Research Programs:

The Master of Science Program in Environmental Sciences:

The scientific and applied importance of ecology and environmental planning has increased as a result of the negative impact of human activities on the elements of the Environment. The foundations of such importance were laid down in the Rio de Janeiro Conference on Global Environment, held in Brazil in 1991. The issues of the Environment are evident in water, soil and air pollution and they represents fields of environmental challenges; for examples; the phenomenon of acid rain, climate changes and pollutants resulting from the incomplete combustion in transportation and factories, pollutants from the inputs and agricultural activities such as fertilizers, pesticides, animal waste, associated problems of solid waste, the deterioration of the soil and its biodiversity and the scarcity of drinking water.

Environmental studies aim at understanding and diagnosing the negative effects on the Environment and determining its factors, whether natural or artificial, and elucidating the means to address them in order to maintain human health and natural resources, created by God on this Earth.

As a result of joint programming between different branches of science, several international universities have begun to teach environmental sciences related to the Environment, such as biology, engineering, economics in view of the interdependence of the environmental elements in nature, and the need to integrate science with some understanding of this interdependence and address the negative impacts.

The Master of Science Program in Environmental Sciences is one of these programs in which many disciplines participate in the Colleges of Science,

Engineering, Pharmacy and the College of Food and Agriculture Sciences. We ask God Almighty to guide us to love and please Him.

This Program aims to:

- 1 - Train scientific cadres in the fields of the Environment to evaluate the various environmental problems and contribute to their diagnosis and treatment.
- 2 - Contribute to the enrichment of knowledge in pure and applied environmental sciences, and to allow those who are enrolled in the program to follow up developments and scientific interests in the areas of the Environment.
- 3 - Train scientific researchers in the fields of environmental science for environmental planning and assessment.
- 4 – Consolidate the cooperation between the University, government and private sectors in the fields of environmental science and to increase the University's interaction with the community.

Degree Title:

Master of Science in Environmental Sciences

Admission Requirements:

Subject to the statutes of the Graduate Studies, the Program requires:

- 1 - The applicant should have a Bachelor's Degree in one of the following scientific fields: (science, agricultural science, engineering, health disciplines) from King Saud University or its equivalent.
- 2 - The applicant must pass the personal interview conducted by the committee supervising the Program.

Degree Requirements and Study System:

- The study for a degree in this Program is by courses only (without thesis) in accordance with Article 33, paragraph 2 of the Unified Graduate Studies Statutes for Saudi universities.
- The student studies 42 credit hours spread over four levels of study in accordance of the Program's Study Plan.

Address:

* Master of Science in Environmental Sciences, College of Science (Building No. 5), Second Floor, Office No. 2 of 46

King Saud University, PO. Box 2455, Riyadh 11451

• Program's Chairman; Phone: 4675823/01, Program's Secretariat Phone: 4675824/01

• Program's Fax: 4675823/01

2- Centers of Research Excellence at KSU:

The status of a Center of Excellence is granted to a university unit characterized by research achievements of concrete quality enabling the university to occupy a prestigious position among other universities.

The following points shed some light on these research centers:

Vision:

Global leadership in strategic fields of science and technology.

Mission:

The establishment of research centers of excellence on a global level, and employing them in founding a knowledge-based society.

Objectives:

- Leading and pioneering in the service of the specialization at community and regional levels.
- Contributing to the support of the capabilities of research and professional activities in the specialization and its development.
- Initiating activities and research projects necessary to strengthen the role of the Centre and keep it in the forefront.
- Providing possible assistance to bodies and institutions that need the expertise and capabilities of research and scientific centers.
- Encouraging many disciplines and linking them.
- Supporting partnership between researchers and scientists on the one hand, and government and private agencies on the other.
- Creating a suitable environment to help researchers to realize innovative solutions for specific projects.

The participation of the Department of Botany and Microbiology

The Department of Botany and Microbiology participates in these research centers through the Director of the Excellence Research Centers in the University, Prof. Dr. Fahad bin Nasser Al-majhadi, allowing an effective role in administrative and technical terms represented, among other activities, in conducting specialized research in the Central Laboratory of the Department of Botany and Microbiology.

Address:

Centers of Research Excellence Program of King Saud University,
P.O. B 2454, Riyadh 11451, Kingdom of Saudi Arabia
Tel: +96614670275, Fax: +96614677601
E-mail: ce@ksu.edu.sa
Website: <http://ce.ksu.edu.sa>

3- Research Chairs

Prince Sultan Research Chair for Environment and Wildlife:



Based on the care and emphasis, placed on the local environment and its natural components, by His Royal Highness Prince Sultan bin Abdul Aziz, Crown Prince, Deputy Prime Minister and Minister of Defense and Aviation and General Inspector, Honorary President of the Saudi Biological Society, a highly esteemed initiative was taken through His Royal Highness's approval, on 32 Jumada I 1428 H, June 9, 2007, of the establishment and financing of Prince Sultan Research Chair for Environment and Wildlife at King Saud University.

What are the main objectives of the Research Chair?

One the most important objectives of the Research Chair is to prepare studies and research in the preservation of the environment and wildlife, maintain close liaison and scientific cooperation between specialists in environmental science and wildlife, contribute to the education and training of qualified cadres in the areas of environment and wildlife, provide expertise and advice to government and private sectors related to the environment and the preservation of wildlife, and build lasting bridges with sound scientific institutions in the world through inviting some of the scholars on a regular basis to participate in research programs in Saudi universities.

Missions Adopted by the Research Chair:

1) To conduct research in the fields of environment and wildlife since the chair will conduct specialized basic and applied research and studies which can be grouped into the following research fields:

- Specialized environmental studies to identify environmental patterns and its bio-components, and the extent of adaptation of these species with the environmental conditions surrounding it.
- Conducting biodiversity inventory researches of species that live in the Saudi Arabia environment, and to ensure that they are scientifically defined by international specialists (scientific reference).
- Conducting genetic studies to identify the genetic fingerprints of the various species in the Kingdom since such activities are important from a scientific and practical considerations and the scientific registration of the genetic

fingerprints of these species in international organizations in order to preserve the national heritage.

- Carrying out the scientific registry for scientific research and specialized studies in the field of environment and wildlife in the international records for the protection of intellectual property rights of researchers and scholars in the Kingdom.

2) To support Graduate Studies as the graduate research is the primary engine of scientific research. Therefore, to achieve the objectives the Research Chair a number of outstanding students, Saudis and non-Saudis, will be attracted to continue their postgraduate studies to obtain a Master's or Doctoral degrees in the field of environment and wildlife. Also, the Chair will adopt the graduation projects of undergraduate students and direct them to the field of environmental studies and local wildlife.

3) To aid in the process of technology transfer since the Chair will be a major outlet for settling several new technologies that can be used in the fields of environmental research and wildlife. Moreover, the Chair will seek to obtain the best techniques and equipment needed to perform the study of scientific and specialized research in the local environment.

4) To provide scientific advice and consultancy services in view of the deficiency in the number of specialists in the field of scientific research, environmental studies and wildlife. Therefore, one of the Chair's tasks will be the provision of scientific advice and consultancy services to interested parties, whether governmental or private, for a fee which could become, with the passage of time, a good source of income for the Chair.

5) To organize courses, seminars, workshops, meetings and public lectures for researchers and specialists in the field of environment and wildlife, in order to keep pace with global changes, and brief them on the major developments in contemporary issues in order to acquire new specialized cognitive skills. Furthermore, such activities contribute towards building a general culture in the community for maintaining environment and natural components, through shedding more light on the problems facing the local environment and its negative repercussions on the safety of the community in general.

Technical Committee overseeing the Chair:

- | | |
|--------------------------------------|------------|
| • Prof. Ibrahim Bin Abdul Wahid Arif | Supervisor |
| • Prof. Ali Bin Abdullah Al-Humaidan | Member |
| • Prof. Ahmed Bin Hamad Al-Farhan | Member |

Activities that have been implemented to activate the programs of the Chair:

- The most important is the choice of a distinguished professor to serve as an Emeritus Professor of the Chair whose specialization lies in the same area of the Chair's research.
- It has been agreed with another distinguished British professor to serve as an advisor to the Chair.
- An Internet site and a booklet for the Chair were made in both Arabic and English.
- A location was allocated to the Chair and a signboard was put up.
- Currently, the required scientific equipment are being ordered.

Areas covered by the Chair and the Beneficiary segment:

In general, all members of the society benefit from the programs of the Chair since the environment is important for various segments and categories. Therefore, it is important to strengthen their knowledge and build a general culture in the field of environmental protection and its natural components. Moreover, researchers, specialists and interested parties in the fields of environment and wildlife, in particular, benefit from the Chair's programs. The areas of interest to the Chair are fields of life sciences in general, and particularly the areas of the local natural environment in the Kingdom, wildlife, and programs of resettlement of icons of wildlife in the Kingdom and their preservation and development.

Chair's Projects:

The Chair has a number of research projects and a workshop was organized and held on Sunday, 6 Jumada I 1429 H, May 11, 2008 which hosted the most prominent specialists in this field and discussed the problems of the local environment and wildlife. Practical recommendations and solutions of appropriate implementation were presented to keep pace with global changes and to inform researchers and specialists on the major contemporary developments in environment, as well as supporting graduate excellence in the fields of environment. A major interest is the striving towards modern technology in the fields of environmental research and wildlife to secure the best techniques and equipment needed to perform the study of scientific and specialized research in the local environment, and meet the requirements of providing scientific advice and consultancy services to interested parties, whether governmental or private in the areas of environment and wildlife.

Through the Chair of Prince Sultan of the Environment and Wildlife, the Society will work to develop the potential and expertise of its members in the service of scientific research projects carried out by the Chair, in addition to adopting the results of scientific research and implementing these results and their recommendations offering scientific solutions applicable to many of the problems of life, environment and wildlife in the Kingdom.

Address:

College of Science, King Saud University - Building No. 5, Second Floor, Office No. 2, 63 - Tel. Box 2455, Riyadh 11451

Website: www.Psrcew.com
Tel: 4675838
Fax: 4679983

Dariya Research Chair for Environmental studies

Dariya Research Chair for Environmental studies at King Saud University has been established in 25/04/1431H, and cares about environmental aspects of engineering and sciences of the environment, and the vision of the chair is to be the first in the environmental programs locally and globally, in order to get a model eco-city, and the mission also summarized in finding a clean environment for sustainable development. The Dariya Research Chair for Environmental studies will achieve its objectives by identifying environmental issues in the city of Diriyah, and a survey of the environmental elements in it.

Dariya Research Chair: Prof. Dr. Nayef bin Abdullah Al-Dhabi.

Chair's Financier: Governor of Dir'iyah City His Highness Prince /Ahmed Bin Abdullah Al-Saud.

Chair's vision: is to be the first in the environmental programs locally and globally, in order to get a model eco-city.

Chair's mission: Towards a clean environment for sustainable development.

Chair's Goals:

1. Preservation of natural environmental components.
2. Achieve sustainable development in a sustainable environment
3. Find a breather cultural, social and recreational
4. Achieve leadership in promoting the concept of model environmental city.

Post address:

Faculty of Science, King Saud University
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Website: <https://c.ksu.edu.sa/aces>