Program Specification

(Bachelor)

Program:	**Biological Science**
Program Code (as per Saudi university ranking):	**05110201**
Qualification Level:	6
Department:	Biology
College:	Science and Arts
Institution:	Najran University
Program Specification:	New ☐ updated* ☒
Last Review Date:	20-8-2024

*Attach the previous version of the Program Specification. (Link)

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A. Program Identification and General Information

1. Program's Main Location :

College of Science and Arts (Main Campus of the University)

2. Branches Offering the Program (if any):

NA

3. Partnerships with other parties (if any) and the nature of each:

NA

4. Professions/jobs for which students are qualified

- Biology Teacher
- Biology Specialist
- Biochemical Scientist
- Biotechnologist
- Botanist
- Zoologist
- Entomologist
- Medical Laboratory Specialist
- Biophysics Specialist
- Scientific Laboratory Specialist
- Biotechnician
- Plant Science Technician
- Entomology technician
- Zoological Technician
- Food Science Technician

5. Relevant occupational/ Professional sectors:

- Ministry of Education
- universities as a teaching assistant or researcher
- Ministry of Environment, Water and Agriculture
- The National Authority for Wildlife Protection.
- Water and Sanitation Authority.
- Authority of Meteorology and Environmental Protection.
- Standards and Metrology Organization
- Ministry of Municipal and Rural Affairs.

- Food preservation and packaging factories.
- Medical analysis laboratories.
- Food and Drug Authority.

6. Major Tracks/Pathways (if any):		
Major track/pathway	**Credit hours** (For each track)	**Professions/jobs** (For each track)
NA		

7. Exit Points/Awarded Degree (if any):	
exit points/awarded degree	**Credit hours**
NA	

8. Total credit hours: (130)

B. Mission, Objectives, and Program Learning Outcomes

1. Program Mission:

Preparing qualified graduates with knowledge and skills in biological sciences, and supporting research activities that meet the requirements of the community and the labor market through an advanced educational program.

2. Program Goals:

1- Prepare well-qualified graduates in biological sciences and related applications.

2- Provide an educational and academic environment that supports student learning and enhances their skills.

3- Promote social responsibility through relevant research activities and community services.

3. Program Learning Outcomes*

Knowledge and Understanding	
K1	Define the main concepts in biology, the scientific basis of biological processes in living organisms, and the fundamentals of animal and plant structure from a taxonomic perspective.
K2	Explain the biological science concepts by using the knowledge and skills of other basic sciences.
K3	Recognize biological phenomena, factors and variables that affect them using biological theories, principles and concepts.
Skills	
S1	Determine and apply the anatomical and physiological characteristics of living organisms according to their classification, life cycles and development.
S2	Employ scientific approaches to solve biological issues, make comparisons, explain biological phenomena, and evaluate ecosystems.

S3	Perform various biological experiments and microscopic tasks using appropriate laboratory tools and instruments in accordance with safety and security regulations.
S4	Use various standard and specialized digital technological tools and applications to process and analyze data and information and in the presentation and discussion of information and scientific reports.
Values, Autonomy, and Responsibility	
V1	Show commitment to academic principles and ethical standards in performing his tasks.
V2	Demonstrate the ability to work independently and cooperatively, interact constructively with others, and take responsibility in decision-making.

* Add a table for each track or exit Point (if any)

C. Curriculum

1. Curriculum Structure

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	8	17	13.07%
	Elective		-	-
College Requirements	Required	6	22	16.92%
	Elective	-	-	-
Program Requirements	Required	33	88	67.69%
	Elective	-	-	-
Capstone Course/Project	Required	1	3	2.30%
Field Training/ Internship	NA	-	-	-
Residency year	NA	-	-	-
Others		-	-	-
Total		48	130	100%

* Add a separate table for each track (if any).

2. Program Courses

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	101Com-3	Computer Science	Required	-	3	Institution
	102ENG-3	Linguistic Texts	Required	-	3	College
	101BIO-4	General Biology	Required	-	4	College
	111 Isl-2	Islamic culture (1)	Required	-	2	Institution
	101Chem-4	General Chemistry1	Required	-	4	College
Level 2	101 Math-4	Calculus I	Required	-	4	College
	112 Isl-2	Islamic culture (2)	Required	-	2	Institution
	103ENG-3	English for Science	Required	-	3	Program
	101Phys-4	Introduction to Physics	Required	-	4	College
	111BIO-2	Cell biology	Required	101BIO-4	2	Program
	201Arab-2	Language skills	Required	-	2	Institution
Level 3	101 Skl 2	University Life Skills	Required	-	2	Institution
	113 Isl-2	Islamic Culture (3)	Required	-	2	Institution

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
	201BIO-2	Lab Safety	Required	-	2	Program
	202Arab-2	Arab Liberation	Required	-	2	Institution
	221BIO-3	Invertebrate zoology	Required	101BIO-4	3	Program
	231BIO-3	Morphology & plant anatomy	Required	101BIO-4	3	Program
	241 Chem -4	Organic Chemistry 1	Required	-	4	Program
Level 4	114 Isl-2	Islamic Culture (4)	Required	-	2	Institution
	211BIO-2	Fundamentals of Ecology	Required	-	2	Program
	212BIO-3	Genetics	Required	111BIO-2	3	Program
	221Nat-3	Biostatistics	Required	-	3	Program
	222BIO-2	Animal Histology	Required	101BIO-4	2	Program
	241BIO-2	Phycology	Required	101BIO-4	2	Program
	361Chem-3	Biochemistry 1	Required	-	3	Program
Level 5	312BIO-2	Microscopic preparations	Required	-	2	Program
	321BIO-3	Parasitology	Required	221BIO-3	3	Program
	322BIO-3	Animal physiology 1	Required	-	3	Program
	323BIO-2	Chordate Zoology	Required	221BIO-3	2	Program
	331BIO-3	Plant physiology 1	Required	-	3	Program
	341BIO-3	Mycology & plant pathology	Required	101BIO-4	3	Program
Level 6	301Edu-3	Think & Communication skills	Required	-	3	College
	313BIO-2	Biodiversity	Required	-	2	Program
	314BIO-3	Pollution & Ecotoxicology	Required	211BIO-2	3	Program
	324BIO-3	General Entomology	Required	221BIO-3	3	Program
	332BIO-3	Plant Taxonomy	Required	231BIO-3	3	Program
	342BIO-2	Bacteriology	Required	-	2	Program
Level	402 Phys-3	Biophysics	Required	-	3	Program

Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
7	421BIO-3	Comparative anatomy of vertebrates	Required	323BIO-2	3	Program
	422BIO-3	Animal physiology 2	Required	322BIO-3	3	Program
	423BIO-3	Economic & medical arthropods	Required	324BIO-3	3	Program
	431BIO-3	Plant physiology 2	Required	331BIO-3	3	Program
Level 8	411BIO-2	Biotechnology& nanotechnology	Required	-	2	Program
	412BIO-3	Graduation Project	Required	-	3	Program
	424BIO-2	Animal Behavior	Required	-	2	Program
	425BIO-3	Virology & Immunology	Required	-	3	Program
	426BIO-2	Embryology	Required	-	2	Program
	432BIO-3	Economic & medical plants	Required	-	3	Program

* Include additional levels (for three semesters option or if needed).
** Add a table for the courses of each track (if any)

3. Course Specifications:

Insert hyperlink for all course specifications using NCAAA template (T-104)

Course descriptions (Link)	

4. Program learning Outcomes Mapping Matrix:

Align the program learning outcomes with program courses' according to the following desired performance levels *(I = Introduced & P = Practiced & M = Mastered).*

Course code & No.	Program Learning Outcomes								
	Knowledge and Understanding			Skills				Values, Autonomy, and Responsibility	
	K1	K2	K3	S1	S2	S3	S4	V1	V2
Islamic culture (1) 111Isl-2								I	

Course code & No.	Program Learning Outcomes								
	Knowledge and Understanding			Skills				Values, Autonomy, and Responsibility	
	K1	K2	K3	S1	S2	S3	S4	V1	V2
Computer Science 101 Com-3		I					I		I
Linguistic texts 102Eng-3									I
General Biology 101BIO-4	I		I	I		I			I
General Chemistry 101Chem-4		I				I			I
Islamic Culture (2) 112Isl-2								I	
Language skills 201Arab-2								I	I
Calculus1 101Math-4		I							I
English For Science 103ENG-3	I	I	I		I				I
Introduction to Physics **101**Phys-4		I				I			I
Cell biology 111BIO-2	I		I	I			I		I
Islamic Culture **(3)** 113Isl-2								I	I
Arab Liberation 202Arab-2								I	I
Lab safety 201-Bio-2		I	I		I	I		I	
Invertebrate zoology 221BIO-3	I		I	I	I			I	
Morphology & plant anatomy 231BIO-3	I		I	I		I	I		I
Organic Chemistry 1 241 Chem -4		I			I				I

Course code & No.	Program Learning Outcomes								
	Knowledge and Understanding			Skills				Values, Autonomy, and Responsibility	
	K1	K2	K3	S1	S2	S3	S4	V1	V2
University Life Skills 101Skl-2							I	I	I
Islamic Culture (4) 114Isl-2								I	I
Animal Histology 222BIO-2	P			P		P	P	P	P
Fundamentals of Ecology 211BIO-2	P		P		P	P		P	
Genetics 212BIO-3	P		P	P			P	P	P
Phycology 241BIO-2	P		P	P		P			P
Biochemistry 1 361Chem-3		P		P		P			P
Biostatistics 221Nat-3	P	P		P	P				P
Mycology & plant pathology 341BIO-3	P		P	P	P	P			P
Plant physiology 1 331BIO-3	P	P	P			P			P
Animal physiology 1 322BIO-3	P		P	P	P	P			P
Parasitology 321BIO-3	P		P	P	P	P		P	
Chordate Zoology 323BIO-2	P				P	P		P	P
Microscopic preparations 312BIO-2			P	P		P	P		P
Think & Communication skills 301Edu-3							P	P	P
General Entomology 324BIO-3	P		P	P		P			P

Course code & No.	Program Learning Outcomes								
	Knowledge and Understanding			Skills				Values, Autonomy, and Responsibility	
	K1	K2	K3	S1	S2	S3	S4	V1	V2
Plant Taxonomy 332BIO-3	M			M	M	M			M
Bacteriology 342BIO-2	M		M		M	M			M
Biodiversity 313BIO-2	M		M			M		M	M
Pollution & Ecotoxicology 314BIO-3	M		M	M	M				M
Comparative Anatomy of vertebrates 421BIO-3	M		M	M		M		M	
Plant physiology 2 431BIO-3		M		M		M	M		M
Animal physiology 2 422BIO-3			M		M	M		M	M
Economic & medical arthropods 423BIO-3	M		M	M	M				M
Biophysics 402 Phys-3		M			M			M	M
Economic & medical plants 432BIO-3	M		M	M				M	M
Animal Behavior 424BIO-2	M		M		M			M	M
Virology & Immunology 425BIO-3	M		M	M	M		M	M	
Embryology 426BIO-2	M		M	M		M		M	
Biotechnology & nanotechnology 411BIO-2	M		M		M		M		M
Graduation Project 412BIO-3			M	M		M	M	M	M

* Add a separate table for each track (if any).

5. Teaching and learning strategies applied to achieve program learning outcomes.

Describe teaching and learning strategies and curricular and extra-curricular activities adopted to achieve the Program's learning outcomes in all areas.

PLO	Teaching and learning strategies	
	Curricular Activities	Extra-Curricular Activities
K1	Lectures, Classroom Activities, Dialogue and Discussion, Presentations, E-Learning and distance education.	University student forum, Academic teams and Science clubs, Visiting academic and research resources (Central lab, Hospital lab).
K2	Lectures, Classroom Activities, Dialogue and Discussion, Presentations.	University student forum, Academic teams and Science clubs, Visiting academic and research resources (Central lab, Hospital lab).
K3	Lectures, Classroom Activities, Dialogue and Discussion, Presentations, E-Learning and distance education.	University student forum, Academic teams and Science clubs, Visiting academic and research resources (Central lab, Hospital lab).
S1	Laboratories, Self-learning, Collaborative learning, Problem-solving, Peer Education and Group discussions	University student forum, Academic teams and Science clubs, Visiting academic and research resources (Central lab, Hospital lab).
S2	Laboratories, Practical performance, Self-learning, Collaborative learning, Problem Solving, Peer Education, Group Discussion, Brainstorming.	University student forum, Academic teams and Science clubs, Visiting academic and research resources (Central lab, Hospital lab).
S3	Laboratories, Practical performance, Problem solving, Peer Education, Group discussion, and Strategy of Presenting Reports.	Academic teams and Science clubs, Visiting academic and research resources (Central lab, Hospital lab), Professional societies and Training (Technological skills)
S4	Laboratories, Practical performance, Self-learning, Cooperative learning, Workshops, Seminars, Guided learning, Presentations, Strategy of presenting reports and Projects.	University student forum, Academic Teams and Clubs (Sciences club), Visiting academic and research resources (Central lab, Hospital lab), Professional societies and Training (Technological skills)
V1	Laboratories, Workshops, Seminars, Teamwork, Group discussion, Self-learning, and Collaborative Learning.	University student forum, Academic Teams and Clubs (Sciences club), Professional societies and Training (Technological skills), Community Service (Volunteering in environmental cleanup efforts), Sports (Football, Athletics)
V2	Workshops, Seminars, Teamwork, Projects, Group discussion, Self-learning, and Collaborative Learning.	University student forum, Academic Teams and Clubs (Sciences club), Professional societies and Training (Technological skills), Community Service (Volunteering in environmental cleanup efforts), Sports (Football, Athletics)

6. Assessment Methods for program learning outcomes.

Describe assessment methods (Direct and Indirect) that can be used to measure the achievement of program learning outcomes in all areas.

The Program should devise a plan for assessing Program Learning Outcomes (all learning outcomes should be assessed at least twice in the bachelor program's cycle and once in other degrees).

PLOs	Assessment Methods	
K1	**Direct Measurement:** • Written Exams • Reports and Oral presentations • Practical Exams • Exit Exam	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
K2	**Direct Measurement:** • Written Exams • Reports and Oral presentation • Practical Exams • Exit Exam	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
K3	**Direct Measurement:** • Written Exams • Reports and Oral presentation • Practical Exams • Exit Exam	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
S1	**Direct Measurement:** • Written Exams • Reports and Oral presentation • Practical Exams • Exit Exam	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
S2	**Direct Measurement:** • Written Exams • Reports and Oral presentation • Practical Exams • Exit Exam	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.

PLOs	Assessment Methods	
S3	**Direct Measurement:** • Written Exams • Reports and Oral presentation • Practical Exams • Exit Exam	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
S4	**Direct Measurement:** • Written Exams • Reports and Oral presentation • Practical Exams • Exit Exam. • The Final Report of Graduation Project [Rubrics-based] • The Final Presentation of Graduation Project [Rubrics-based]	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
V1	**Direct Measurement:** • Teamwork Assessment. • Reports and Oral presentation. • The Final Report of Graduation Project [Rubrics-based] • The Final Presentation of Graduation Project [Rubrics-based]	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.
V2	**Direct Measurement:** • Teamwork Assessment. • Reports and Oral presentation • The Final Report of Graduation Project [Rubrics-based] • The Final Presentation of Graduation Project [Rubrics-based]	**Indirect Measurement:** • Student's self-evaluation survey. • Employers' evaluation of the program graduates' proficiency.

D. Student Admission and Support:

1. Student Admission Requirements

1- **The applicant must hold a Saudi nationality or be born of a Saudi mother.**

2- **The student should hold a general Saudi secondary school (high school) certificate or its equivalent from within Saudi Arabia or from other countries.**

3- **He/she should have obtained the secondary school certificate in a period of less than 5 years prior to the date of application; and the Rector has the authority to exclude in case of convincing reasons.**

4- **He/she should pass any aptitude exam or interview.**

5- He/she must have a record of good reputation and behavior.
6- Being physically fit.
7- He/she must obtain the approval of his/her employer in case of being employee in government or private agency.
8- He/she should satisfy other conditions stipulated and announced by the NU Board at the time of application.
9- The applicant is not holder of a bachelor degree from another university.
10- The student should not have been dismissed from any other university for disciplinary or academic reasons.

Admission Requirements Link

2. Guidance and Orientation Programs for New Students

(Include only the exceptional needs offered to the students of the Program that differ from those provided at the institutional level).

- An annual introductory meeting is organized for new students in the program that includes introducing students to (the vision and mission of the program - admission and registration requirements - graduation completion requirements - program courses and the distribution of courses according to level according to the field - program structure - academic standards) ,security and safety procedures - university student rights - violations and penalties - student guide - biology department program guide. Spreading the culture of quality to students.

Program Introductory Guide Link

3. Student Counseling Services

(Academic, professional, psychological, and social)
(Include only the exceptional needs offered to the students of the Program that differ from those provided at the institutional level).

1- Guiding the student educationally and academically through the Academic Advising Unit at the college.
2- Allocating an academic supervisor for each student
3- Holding an introductory meeting at the beginning of each semester for the new students.
4- Receiving new students and introducing them to the university system.
5- Inform students of the dates of addition/deletion of courses and the electronic way to do so.
6- Explain the schedule for students and how to know the time and place of lectures.
7- Introducing students to the names, numbers and symbols of the courses and their requirements.
8- Informing students of the academic calendar.
9- Identify the problems facing the student, especially those that affect academic performance, and work to solve them.
10- Introducing students to their rights and duties within the college and the university
11- Providing students with the rules of postponement and apology for studying.
12- Guiding students who are struggling academically during office hours, as well as lectures, the teacher is asked to help the student by providing advice, providing references if possible, and correcting assignments

13- Encourages students to follow the instructions issued by the Deanship of Student Affairs and encourages them to attend seminars and training courses held by the Deanship or the Alumni Unit.

14- There is a public fund to receive students' complaints and suggestions, feedback on these complaints and suggestions. "Notes" here means that student complaints have been referred to the relevant administrator and resolved; they are divided into different types of complaints related to facilities, equipment, schedules, campus services, academic achievement, etc.

15- For psychological and social counseling, the academic advisor of the department must provide advice, if possible, and can coordinate with the psychological and educational counseling unit at the university.

- The Academic Advising Unit at Najran University also provides the interactive electronic platform for university advising entitled (Guide Me): Link

4. Special Support

(Low achievers, disabled, gifted, and talented students).

Academic advising is provided to all categories of gifted underachieving students with disabilities. There are many training programs and workshops for students who are classified as visually or hearing impaired from Najran University. The student must also disclose his status and register in the following link

https://www.nu.edu.sa/ar/web/university-guidance-and-guidance-department/home

Program aproved mechanism of Identifying Gifted , Creative, low achievers, and disabled students

For low achievers disabled:-

- To give them clear, gradually instructions.
- To be ready to give them extra help or explanation in office hours.
- To be aware of their learning or studying habits and try to improve them.
- Make professional and fair judgments about your students' performance.
- Never give a passing mark to the learner who does not deserve it.
- The program does not accept students with physical disabilities (such as the deaf, the blind, ...) that are not appropriate for practical courses.

For gifted and talented-:

- The top students are counted according to the GPA
- The academic advisor follows up the mentors and guides them in a way that achieves their excellence.
- The outstanding students in the program are honored at the college honoring ceremony.
- A tribute plate is created for outstanding students
- The activity officer in the department invites talented students to join the college's various activities

Activities (sports, cultural and ....) are organized for gifted students

E. Faculty and Administrative Staff:

1. Needed Teaching and Administrative Staff

Academic Rank	Specialty		Special Requirements / Skills (if any)	Required Numbers		
	General	Specific		M	F	T
Professor	Botany	-Plant Taxonomy	Good publication records	1	-	1
Associate Professor	Botany	-Plant physiology -Plant Ecology	Good publication records	2	-	2
Assistant Professor	Microbiology	-Bacteriology	-Good publication records -Teaching experience	3	-	3
	Zoology	-Animal Histology -Animal Ecology				
Lecturer	-	-	-	-	-	-
Teaching Assistant	Biology	-		2	-	2
Technicians and Laboratory Assistant	Lab Tech	-	-	3	0	3
Administrative and Supportive Staff	-	-	-	2	0	2
Others (specify)						

F. Learning Resources, Facilities, and Equipment:

1. Learning Resources

Learning resources required by the Program (textbooks, references, e-learning resources, web-based resources, etc.)

Faculty members are addressed to put their suggestions on the required references in their respective courses.

2. Forming a committee in the department to follow up and test references and specialized sources.

3. Addressing the Deanship of Library Affairs by providing the required references

4. Providing books and references in the university library and libraries specialized in providing books before the start of the study in an appropriate time.
5. Encourage students to take advantage of the digital library.
6. A course is held by the Deanship of Library Affairs every semester for students and faculty members on how to search in the library and deal with the university's digital library.
7. Specialized committees are formed in the different branches of biology according to the groups of courses ecology - entomology - anatomy - embryology - bacteriology - immunology and viruses ... And the suitability of the courses to achieve the objectives of the program.
8. Provide courses on how to access the digital library.
9.Directing students to the sources and references approved in the program and available in the paper and digital library, which can be used through the brief description of the course, which is distributed to students through brochures containing a brief description of the course distributed to students in the introductory lecture at the beginning of the semester.
10. The contents of the library of books and references are reviewed and determine their efficiency and adequacy compared to the reference standards.
11. Exchanging information on the extent of learning resources with colleges with which it has partnership agreements.
- The satisfaction of faculty members in the program with learning resources is measured through a survey dedicated to measuring the satisfaction of faculty members with the learning resources of the program.

2. Facilities and Equipment

(Library, laboratories, classrooms, etc.)

1. Central Library provides textbooks and electronic books.
2. Internet service is available at no cost in the University.
3. The Saudi digital library (SDL) is available at no cost in the University.
4. The digital library for the deanship of libraries is available for free in the University.

3. Procedures to ensure a healthy and safe learning environment

(According to the nature of the Program)

https://nejranuniversity-my.sharepoint.com/:b:/g/personal/smalasmari_nu_edu_sa/EdmIvhuf_vRGjzELJFP5t3kBhR12swzk9XDmFVfAedqdNw?e=OUpKpU

G. Program Quality Assurance:

1. Program Quality Assurance System

Provide a link to the quality assurance manual.

https://nejranuniversity-my.sharepoint.com/:b:/g/personal/smalasmari_nu_edu_sa/EWZZN9lkL41Og2PxXhHszswB_C_qS2xila85RroxMF8eWw?e=8r2Eqq

2. Procedures to Monitor Quality of Courses Taught by other Departments

The descriptions of the university and college requirements are reviewed and discussed in the department council of the program

2- Review the matrices that show the link between the learning outcomes of these courses and the program's learning outcomes.

3- Follow-up of the data contained in the course reports, including the values they contain, which achieve the learning outcomes of the course and the extent of student satisfaction with the course and teaching performance.

4- Monitoring the negatives contained in the course reports, addressing the concerned programs to take appropriate corrective measures, including them in the improvement plans, and following up on their implementation by program officials.

3. Procedures Used to Ensure the Consistency between Main Campus and Branches (including male and female sections).

NA

4. Assessment Plan for Program Learning Outcomes (PLOs),

The Biological Science program has planned its cycle for evaluating the achievement of its PLOs using both direct and indirect methods. **The program used two direct assessment methods:**

- The aligned course learning outcomes at the mastery level.
- Related questions of the exit exam.

All the offered courses are mapped to the appropriate PLOs. Mapping courses to the PLOs ensures that all PLOs are addressed by several courses at different levels of the program. In addition, this practice helps the program monitor the progress in achieving its PLOs and make early corrective and improvement changes.

In addition to the methods for direct assessment, **the program uses two methods for indirect assessment:**

- Student's self-evaluation survey.
- Employers' evaluation of the program graduates' proficiency.

These help the program to evaluate its PLOs achievement from different perspectives. Results from all four methods are discussed and considered in corrective and improvement measures. The Annual evaluation results are used to make minor changes at the level of the program/ courses, while major changes are considered during the comprehensive periodic review of the program.

Course Mapping of PLOs:

To set the stage for the assessment process, the material covered in each course, together with its expected course learning outcomes (CLOs), are used to identify the certain number of program learning outcomes that are most probably be covered by the course. It is important to mention here that each of the course CLOs should be associated with one of the chosen PLOs. Thus, the PLO with a single CLO implies that this CLO statement may be identical to that of the PLO. To this end,

each course has identified some specific number of measurable Course Learning Outcomes (CLOs) and these CLOs are mapped to the chosen different PLOs. This process of course-PLO mapping is carried out for each Department/College course. It is also important to mention here that we have chosen not to map university requirements or the basic science courses (Math, Physics, Chemistry, and Statistics) to the outcomes. These do automatically satisfy the program learning outcomes. The mappings are made by each course team (involving course coordinator(s) and instructors, for the course) in consultation with the Program Quality Committee.

Direct Assessment:

The direct assessment of the outcomes usually relies on the coursework and based a variety of tools that include combinations (as defined in the articulation matrix at the beginning of academic year) of final exam, midterm tests, quizzes, homework, laboratory works, assignments, practical, projects, presentations, etc. The assessment tools do, however, vary from course to course.

Indirect Assessment:

Alumni survey and employer survey are formal electronic surveys filled in by the alumni and employers respectively that directly target each one of the Program Learning Outcomes.

Course Mapping of PLOs:

PLO	Course that measures the PLO	Time of measuring	Method	Responsible of the assessment
K1	1- Plant physiology 2 (431BIO-3) 2- Animal physiology 2 (422BIO-3) 3- Comparative anatomy of vertebrates (421BIO-3) 4- Biodiversity (313BIO-2).	The end of 1st Semester (1444 AH).	**Direct Measurement:** **1. Aligned Courses** • Written Exams • Reports • Practical Exams **2. Exit Exam** **Indirect Measurement:** 1. Final Year students Evaluation of PLOs. 2. Employer Evaluation Survey	Development and Quality Subcommittee responsible for teaching and learning standards
K2	1- Biostatistics (221Nat-3). 2- Plant Taxonomy (332BIO-3) 3- Plant physiology 2 (431BIO-3)	The end of 2nd Semester (1444 AH).		
K3	1- Mycology& plant pathology (341BIO-3) 2- Biodiversity (313BIO-2). 3- General Entomology (324BIO-3) 4- Pollution & Ecotoxicology (314BIO-3).	The end of 2nd Semester (1444 AH).		
S1	1- Biodiversity (313BIO-2). 2- Mycology& plant pathology (341BIO-3) 3- General Entomology (324BIO-3) 4- Graduation Project (412BIO-3)	The end of 3rd Semester (1444 AH).	**Direct Measurement:** **1. Aligned Courses** • Written Exams • Reports • Practical Exams **2. Exit Exam** **Indirect Measurement:** 1. Final Year students Evaluation of PLOs. 2. Employer Evaluation Survey	
S2	1- General Entomology (324BIO-3) 2- Biotechnology & nanotechnology (411BIO-2) 3- Biodiversity (313BIO-2). 4- Pollution & Ecotoxicology (314BIO-3).	The end of 3rd Semester (1444 AH).		
S3	1. Comparative anatomy of vertebrates (421BIO-3) 2- Animal physiology 2 (422BIO-3) 3- Plant physiology 2 (431BIO-3) 4- Graduation Project (412BIO-3)	The end of 1st Semester (1445 AH).		

S4	1- Comparative anatomy of vertebrates (421BIO-3) 2- Biotechnology & nanotechnology (411BIO-2) 3- Economic & medical plants (432BIO-3) 4- Graduation Project (412BIO-3)	The end of 1st Semester (1445 AH).		
V.1	1- Graduation Project (412BIO-3)	The end of 2nd Semester (1445 AH).	**Direct Measurement:** **1. Aligned Courses** • Teamwork Assessment • Reports • Presentations **2. Exit Exam** • Final Presentation • Final Report **Indirect Measurement:** 1. Final Year students Evaluation of PLO 2. Employer Evaluation Survey	
V.2	1- Biotechnology & nanotechnology (411BIO-2) 2- Virology & Immunology (425BIO-3) 3- Graduation Project (412BIO-3)	The end of 2nd Semester (1445 AH).		

Continuous improvement process:

The program objectives set a guideline for program learning outcomes, curriculum development, and teaching procedure. To ensure achievement of the program learning outcomes, a variety of assessment tools as discussed were used. The level of assessment and evaluation process is conducted at the end of the academic year, and the results of this assessment process are used to improve the educational process to achieve the targeted program learning outcomes. The process is summarized below which depicts the assessment and evaluation process and hence closing the loop of program learning outcomes. Note that evaluation is made at two different levels, course-level and program level. The outcome of the evaluation is utilized as feedback for improvement and incorporated into planning to enhance the overall attainment of Program Learning Outcomes.

To this end, the Coordinator of the Quality Committee at the Biology program collects the course portfolios and reports, and Quality Committee reviews the course reports that include any suggestions and improvement by the faculty members. This process is held at the end of the academic year. The Quality Committee meets to discuss comments and feedback from the students' attainment of outcomes, Student Course outcomes and Alumni survey and employer survey. The committee discusses areas of strength, areas for improvement, and decides on actions for improving program learning outcomes.

5. Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Teaching and learning	Students in all levels of the program.	Quality of the courses "Survey"	End of each semester
	Final year students	Quality of learning experience "Survey"	Last month of the academic year
	Students' cohorts	Completion rate "data"	End of the academic year

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
	Students	First-year retention rate "data"	First semester
	Alumni	Graduates' employability and enrolment in postgraduate programs: "communication data"	End of the academic year
	Employers	Evaluation of the program graduate's proficiency "Survey"	First semester
Academic and educational environment	Human resources/ student registers	The ratio of students to teaching staff "data."	Beginning of the academic year
	Final year students	Quality of learning experience "related items in the survey"	Last month of the academic year
	Teaching staff	Participation in training activities "data"	Last month of the academic year
	students	Participation in extracurricular activities "data"	Last month of the academic year
	Teaching staff	Quality of the organizational and academic climate "survey"	First month of the second semester
Social engagement	Teaching staff	Percentage of publications of faculty members "data"	Last month of the academic year
	Teaching staff	Rate of published research per faculty member "data"	Last month of the academic year
	Teaching staff	Citations rate in refereed journals per faculty member "data"	Last month of the academic year
	Teaching staff	Participation in community service activities "data"	Last month of the academic year
	Students	Participation in community service activities "data"	Last month of the academic year

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Overall Program evaluation	Independent reviewer	Self- study report	Each comprehensive evaluation cycle

Evaluation Areas/Aspects: e.g., leadership, effectiveness of teaching & assessment, learning resources, services, partnerships, etc.
Evaluation Sources: students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, etc.
Evaluation Methods: e.g., Surveys, interviews, visits, etc.
Evaluation Time: e.g., beginning of semesters, end of the academic year, etc.

6. Program KPIs*

The period to achieve the target (1446 AH) year.

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
1	KPI-P-01	Students' Evaluation of Quality of learning experience in the Program	85%	Questionnaires	Last month of the academic year
2	KPI-P-02	Students' evaluation of the quality of the courses	75%	Questionnaires	End of each semester
3	KPI-P-03	Completion rate	Not less than 50%	Statistical data	By the end of the academic year
4	KPI-P-04	First-year students retention rate	Not less than 60%	Statistical data	First semester
5	KPI-P-05	Students' performance in the professional and/or national examinations	NA	NA	NA
6	KPI-P-06	Graduates' employability and enrolment in postgraduate programs	Not less than 20 % employability Not less than 10% post graduate studies	Statistical data	End of the academic year
7	KPI-P-07	Employers' evaluation of the program graduates proficiency	No less than 70%	Surveys & interviews	First semester
8	KPI-P-8	Ratio of students to teaching staff	18:1	Statistical data	Beginning of the academic year
9	KPI-P-9	Percentage of publications of faculty members	Not less than 75%	Statistical data	End of the academic year
10	KPI-P-10	Rate of published research per faculty member	1:1	Statistical data	End of the academic year

No.	KPIs Code	KPIs	Targeted Level	Measurement Methods	Measurement Time
11	KPI-P-11	Citations rate in refereed journals per faculty member	25:1	Statistical data	End on the academic year
Additional program KPIs					
12	KPI-Bio-01	Percentage of teaching staff participation in training activities.	Not less than 75% attended at least one training workshop".	Statistical data	Last month of the academic year
13	KPI-Bio-02	Percentage of students' participation in extracurricular activities.	Not less than 75% participated in at least one activity	Statistical data	Last month of the academic year
14	KPI-Bio-03	Teaching staff evaluation for the organizational and academic climate.	Not less than 75%	Questionnaire	First month of the second semester
15	KPI-Bio-04	Percentage of teaching staff participation in at least one community service activity	No less than 50 %	Statistical data	Last month of the academic year
16	KPI-Bio-05	Percentage of Students' participation in at least one community service activity	No less than 50 %	Statistical data	Last month of the academic year

*including KPIs required by NCAAA

H. Specification Approval Data:

Council / Committee	Department Of Biology
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