

Biology

Quality Assurance Manual



QUALITY ASSURANCE MANUAL

COLLEGE OF SCIENCE - BIOLOGY PROGRAM

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Key Academic Terms

A quality culture is essential to achieving it in any educational institution. The concepts and terms included in this guide have been compiled to ensure they are understood as intended.

Quality:

The degree to which a product, service, or process meets established standards and satisfies stakeholders; it also involves continuous improvement.

Institution:

An official entity that provides educational or administrative services, such as a university or college.

Academic Program:

An organized study plan consisting of courses and educational content designed to achieve specific academic objectives (e.g., Bachelor of Chemistry).

Course:

A single unit of study within an academic program that includes specific content, learning objectives, and assessment activities.

National Qualifications Framework (NQF):

A national system that defines educational levels and learning outcomes for different degrees and qualifications to ensure standards and comparability between programs.

Internal Review:

An evaluation conducted by independent experts from the institution to verify the quality of programs and educational services.

Learning Outcomes:

The knowledge, skills, and attitudes expected of a student after completing a course or academic program.

Key Performance Indicators (KPIs):

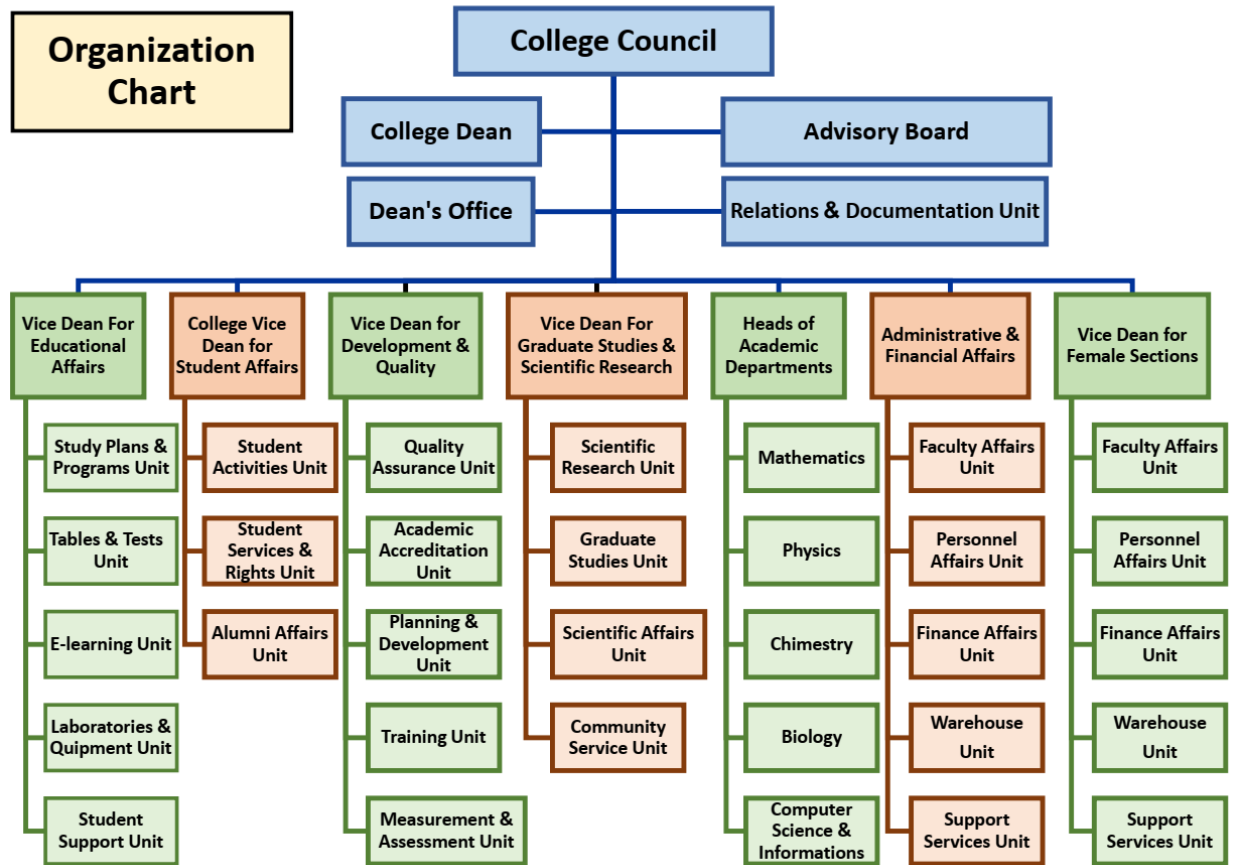
Quantitative or qualitative metrics used to measure how effectively an institution is achieving its goals and strategies.

PART 1 – INTRODUCTION

The Quality Assurance and Accreditation Committee is a key supporter of the Biology department's goals and mission, evaluating the quality of educational and administrative processes and setting requirements for obtaining national and international academic accreditation for the Bachelor of Biology program. The committee enhances the educational experience to ensure career readiness, maintaining this focus to earn the trust of students, the community, and graduates' employers. The committees' work focuses on evaluating the Bachelor of Biology program's performance, identifying the most effective methods to advance education, and delivering valuable services to the community. The Quality Assurance and Accreditation Committee is honoured to present this guide, which outlines the tasks and organisational structure of the Quality Assurance and Accreditation Unit at the College. The Biology program at the College of Science, Majmaah University, adheres to quality policies aligned with the quality standards approved by the National Center for Academic Accreditation and Evaluation (NCAAA). The procedures and standards outlined by the National Commission for Academic Accreditation & Evaluation (NCAAA) are based on the expectation that programs will adopt such a responsibility system and take appropriate actions to ensure that high-quality criteria are met. Given the importance of the higher education system to students, their families, and the wider community, one cannot simply assume that quality will be achieved. Quality must be verified through independent processes to ensure everyone is committed to achieving high standards. The NCAAA accreditation processes for higher education institutions and the programs provide this verification.

This manual is intended.

- To guide and support the NCAAA accreditation processes.
- To establish a comprehensive quality management system for Science programs.
- To define responsibilities and procedures at every stage of academic work.
- To ensure transparency, accountability, and continuous improvement
- To align learning outcomes with the National Qualifications Framework (NQF).
- To provide a unified reference for quality assurance practices



The Biology Department is dedicated to improving, updating, monitoring, and assessing its programs in accordance with specific academic standards and the National Framework, thereby making it a vital part of the college's Mission and Vision. The Department offers two programs:

1. **Biology Program [BIOL]**
2. **Environment Protection Technology [EPT]**

Faculty Mission

Qualify national cadres capable of competing in the labour market, meeting the requirements of sustainable development, and contributing to scientific research and community service.

Faculty Vision

To be one of the best colleges of science; seek academic accreditation locally and globally; and to have a high-quality academic environment conducive to having graduates who are capable of achieving the goals of sustainable development.

Biology Program Mission

Qualify national cadres capable of competing in the field of biological sciences, meeting the requirements of sustainable environment development, and contributing to biological research and community service

Objectives

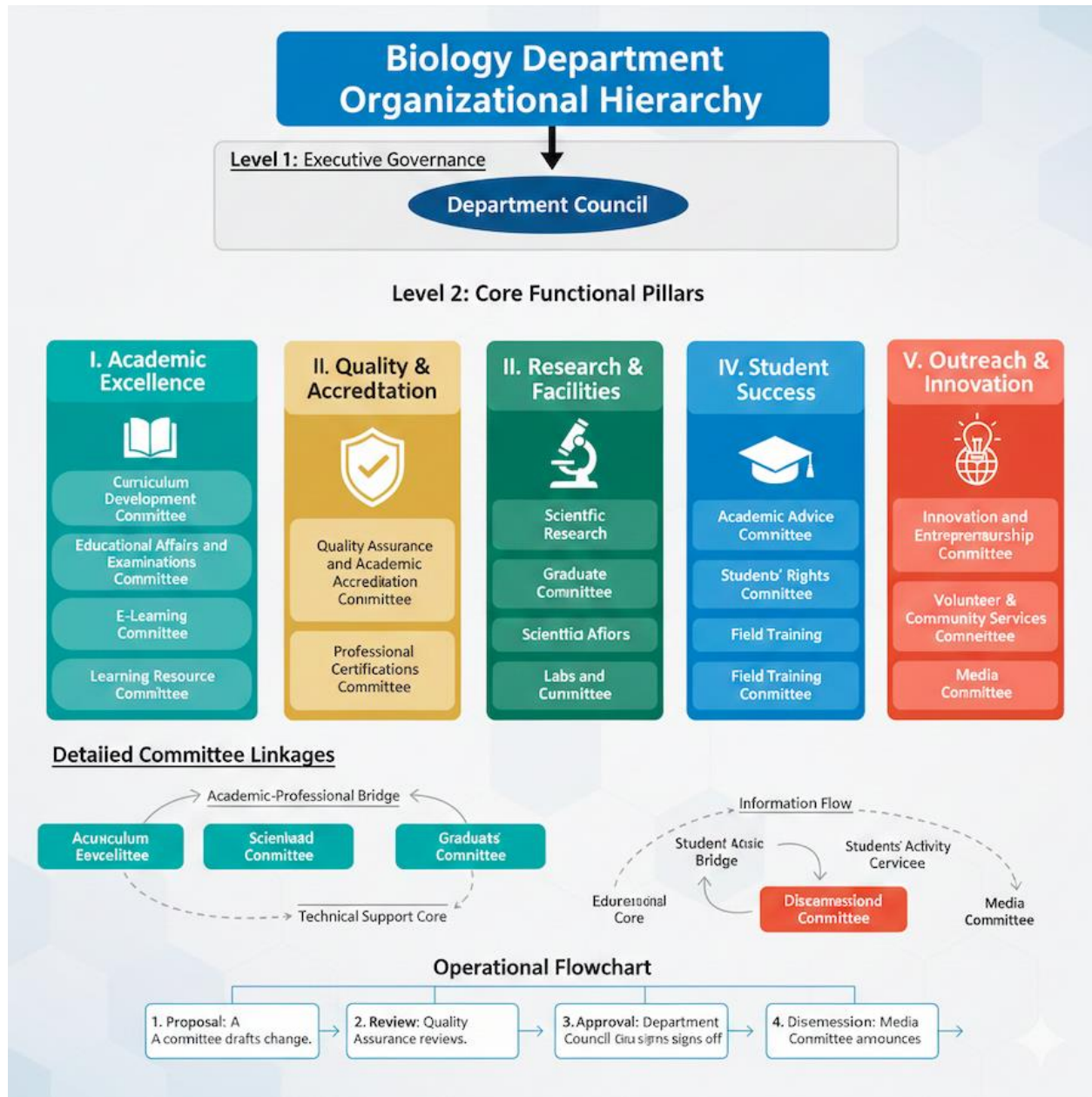
- Apply various general education competencies through the study of Biology.
- Utilize their knowledge in modern industry or teaching in high-quality graduate programs in Biology.
- Learn and explain biology within a professional, legal, and ethical responsibility.

Environment Protection Technology Program Mission

Provide quality educational services to undergraduate students in environmental protection technology, preparing them for professional practice and ethical work to achieve a sustainable environment both locally and globally.

Objectives

- Possess a core understanding of environmental science and use modern approaches for environmental protection and improvement.
- Apply their knowledge to conserve, rehabilitate, and improve the environment.
- Carry out fundamental and applied research in environmental science.
- Contribute to solving the ecological and industrial problems facing the developmental plans.



Tasks of the Department Committees

1. Department Council

1. Supervising the implementation of the working plans of the various activities of the department.
2. Follow up on the completion of all academic accreditation requirements.
3. Approve Department and Program documentation manuals.
4. Holding weekly meetings to review and approve the department's quality management system reports, follow up and coordinate with the Vice Dean of Development and Quality, and provide periodic reports.
5. Establish the department's vision, mission, and goals, and periodically review them.
6. Follow up on the implementation of the department's action plan.
7. Identifying strengths and weaknesses in the program's activities and developing plans to enhance or address them.
8. Activate the role of the advisory committee in the department.
9. Develop and implement training programs to enhance faculty teaching, research, and technical skills.

2. Quality Assurance and Academic Accreditation Committee:

1. Enhancing the quality culture among faculty members, department staff, and students.
2. Develop, manage, and monitor quality-control processes across the department.
3. Prepare, monitor, distribute, collect, and analyze all five questionnaires for the National Commission for Academic Evaluation and Accreditation.
4. Selecting performance indicators, benchmarking the program, analyzing the results, and developing improvement plans based on the analysis.
5. Preparing and revising the Program Description, course specifications, and Course Reports assembled from college members; saving them electronically; and organizing them into their respective files.
6. Organizing, supervising, and maintaining the program's documentation in the academic room to ensure it is ready during the external auditors' review.
7. Ensure the preparation of copies of student exams and answer sheets for all program courses each semester.
8. Regularly update and revise all accreditation files to ensure they are ready for any sudden scrutiny visits and authorized inspections.
9. Supervising and preparing the Self-study Report (SSR) for obtaining or updating national and international accreditation.
10. Reviewing study plans from internal and external bodies to ensure compliance with an academic excellence plan, emphasizing the fulfilment of the "National Qualifications Framework. Submit periodic reports on the scientific programs to the department council.
11. Supervise the implementation of the administrative quality system and address any gaps that hinder its effective rollout.
12. Developing plans to enhance the department's quality management system.

3. Academic Advice Committee

1. Create a plan for the student guidance program and update it annually.
2. Raising awareness of the importance of academic, scientific, psychological, and social factors in accreditation.
3. Raising students' awareness of the support services and activities offered by the college and university, along with follow-up.
4. Addressing and responding to students' proposals or complaints and working to resolve them.
5. Develop preventive programs to safeguard students from vulnerability.
6. Provide academic support by analyzing the situation of students with default or low rates and developing educational programs to assist students with unsatisfactory performance.
7. Follow-up on extracurricular activities

4. Students' Rights Committee

1. Creating a database for students with academic challenges.
2. Organising regular meetings for students.
3. Working to solve the obstacles facing students.

5. Curriculum Development Committee

1. Developing plans and curricula tailored to the societal and scientific needs of the community.
2. Evaluate the suitability of courses for scientific practice research.
3. Submit periodic reports on the curricula and scientific programs to the department council.
4. Introducing good interdisciplinary programs.
5. Preparation and implementation of workshops for proposed or new departmental programs.
6. Follow-up to update the scientific references for the decisions.

6. Graduate Committee

1. Maintaining and updating a database of department graduates periodically.
2. Collecting personal data of the students who are expected to graduate, including their contact details.
3. Attract graduates qualified to continue their higher studies.
4. Follow-up promotion of faculty members.
5. Collecting, tabulating, and documenting data on employers and research institutions, including contact information, and exploring opportunities to collaborate with them to recruit graduates and build effective partnerships.
6. Develop communication programs, whether electronic or otherwise, to strengthen the relationship between graduate students and employment.
7. Surveying (preparation, distribution, and collection of questionnaires) of graduates' opinions who have jobs in the public and private sectors outside the college.

8. Find an effective mechanism to provide employment opportunities for graduates in their fields of specialisation.
9. Communicating with the public and private sectors to find opportunities to train students and qualify them to work in summer programs.

7. Labs and Equipment Committee

1. Conduct complete inventories of materials, supplies, and equipment; organise their placement and ensure availability for student labs.
2. Ensure all laboratory equipment in the student laboratories is available and operational.
3. Execute periodic and preventive maintenance plans, ensure cleanliness, and secure spare parts through approved contracts.
4. Follow up on faculty requests to equip laboratories and their implementation.
5. Maintain usage logs (date, day, examiner signature) for devices and follow up on equipment updates.
6. Develop safety policies to ensure departmental safety.
7. Process faculty requests for laboratory equipment and collect teaching staff needs well in advance.
8. Inventory safety equipment, organize placement, and maintain it regularly.
9. Ensure safety measures are in place before periodically inventorying and organizing laboratory materials, equipment, and supplies.
10. Preparation of awareness-raising instructional publications for students on safety procedures for various hazards (electrical and/or chemicals) at the beginning of the academic year.
11. Follow up on the conservation of chemical and biological wastes in the department.

8. Scientific Research Committee

1. Develop an operational plan for the department's scientific research and monitor its implementation.
2. Follow up on student scholarships and submit periodic reports.
3. Establishing and updating a database of research, scientific projects, and conferences locally and internationally, in addition to patents, prizes, books, and translations.
4. Encouraging publication in scientific journals with a global classification.
5. List of graduate students involved in research, projects, conferences, patents, and international activities awards.
6. Conducting an annual evaluation of scientific research projects in the department and submitting recommendations to the Higher Studies and Scientific Research.

9. Volunteer & Community Services Committee Partnership

1. Caring for social relations between faculty members and/or the department.
2. Develop internal and external visit programs for the college or department.
3. Receiving foreign delegations and organising their residency program visits.
4. Caring for social relations between faculty members or the department.

5. Develop programs to strengthen the department's community relations and follow up on their implementation.
6. Monitoring and tabulating training programs, scientific consultations, and cultural and awareness activities conducted by the department that contribute to community service and development plans.
7. Supervising the activities that serve the community, namely: natural history museums, botanical gardens, research stations, environmental monitoring sites, etc.
8. Encourages employees and students to take initiative to maximise the service role's societal impact.
9. Activating the partnership between the program and community institutions, especially public and private schools.

10. Innovation and Entrepreneurship Committee

1. Stimulating thinking and innovation among male and female students.
2. Collaborating with the college to deliver workshops and events that foster innovation, leading to new products and services.
3. Providing technical support for male and female innovation students.
4. Carrying out all tasks assigned by the unit that fall within its jurisdiction.

12. Educational Affairs and Examinations Committee:

1. Following up on the department's academic affairs, providing opinions, and evaluating them.
2. Preparing study schedules.
3. Coordinating periodic and final examinations.
4. Resolving student issues with study schedules, conflicts, and academic load.
5. Handling student complaints and inquiries about final exams before escalating to the Department Head.

13. Field Training Committee

1. Identifying students who meet the summer conditions for training.
2. Preparing and organizing preparatory courses for summer training.
3. Maintaining constant communication with students and training entities during the summer training period.
4. Receiving and following up on periodic and final reports.
5. Evaluating student performance during the summer training period.

14. E-Learning Committee:

1. Surveying the needs related to e-learning.
2. Organizing training courses for both students and department members regarding e-learning.
3. Providing support and advice to students.
4. Identifying obstacles in Blackboard.
5. Follow up on electronic tests in the department.

15. Media Committee:

1. Documentation of all activities.
2. Coordinate with college PR to publish department activities on the college and department webpages.
3. Monitoring and updating the department webpage.

16- Students' Activity Committee:

1. Develop a timeline of academic events. year
2. Ensure that all proposed activities comply with university rules, safety protocols, and local regulations.
3. Oversee event promotion via social media, posters, and newsletters to maximise student engagement turnout.
4. Identify and recruit talented students (artists, speakers, athletes) for events.
5. Conduct surveys to identify students' preferred activities.

17- Learning Resource Committee:

1. Review faculty requests to ensure each ordered textbook and reference material is directly mapped to a specific course.
2. Recommend hardware and software purchases for the learning commons, including computer lab equipment and simulation software.
3. Organize workshops to train faculty and students in the use of new research databases and citation tools.
4. Act as the formal channel for complaints or suggestions regarding library services.

Assurance of Academic Program Quality: Ensuring academic program quality is a key goal to guarantee performance and outputs. Quality management is crucial in maintaining performance quality, structuring committees, and defining their tasks and responsibilities. The relationships between the committees and some of the functions of the program quality management include the following:

- Preparing implementation plans for academic programs and monitoring their execution.
- Studying and submitting program amendments to the relevant authority.

- Quality standards during the implementation of performance quality and program application.
- Supervising the measurement of the teaching staff's performance indicators program.
- The annual evaluation of the program.
- Preparing the next study for the program with the help of the academic staff.

Quality Management System in Academic Programs:

To ensure the quality of academic programs, a rigorous system must organise the planning, implementation, and follow-up processes. The model is summarised in improving and providing the following:

1. **Planning:** The program is planned by establishing the academic implementation plan after measurement operations, identifying strengths to enhance, and weaknesses to address for improvement.
2. **Implementation:** This phase involves starting implementation and observing activities.
3. **Evaluation/Analysis:** It's a process of measuring, evaluating, analyzing results, proposing improvements, and establishing mechanisms for implementation.
4. **Correction:** The steps for improvement and responsibility for achieving the program's goals are clarified. If the desired results are not achieved after repetition, the process returns to planning for another cycle.

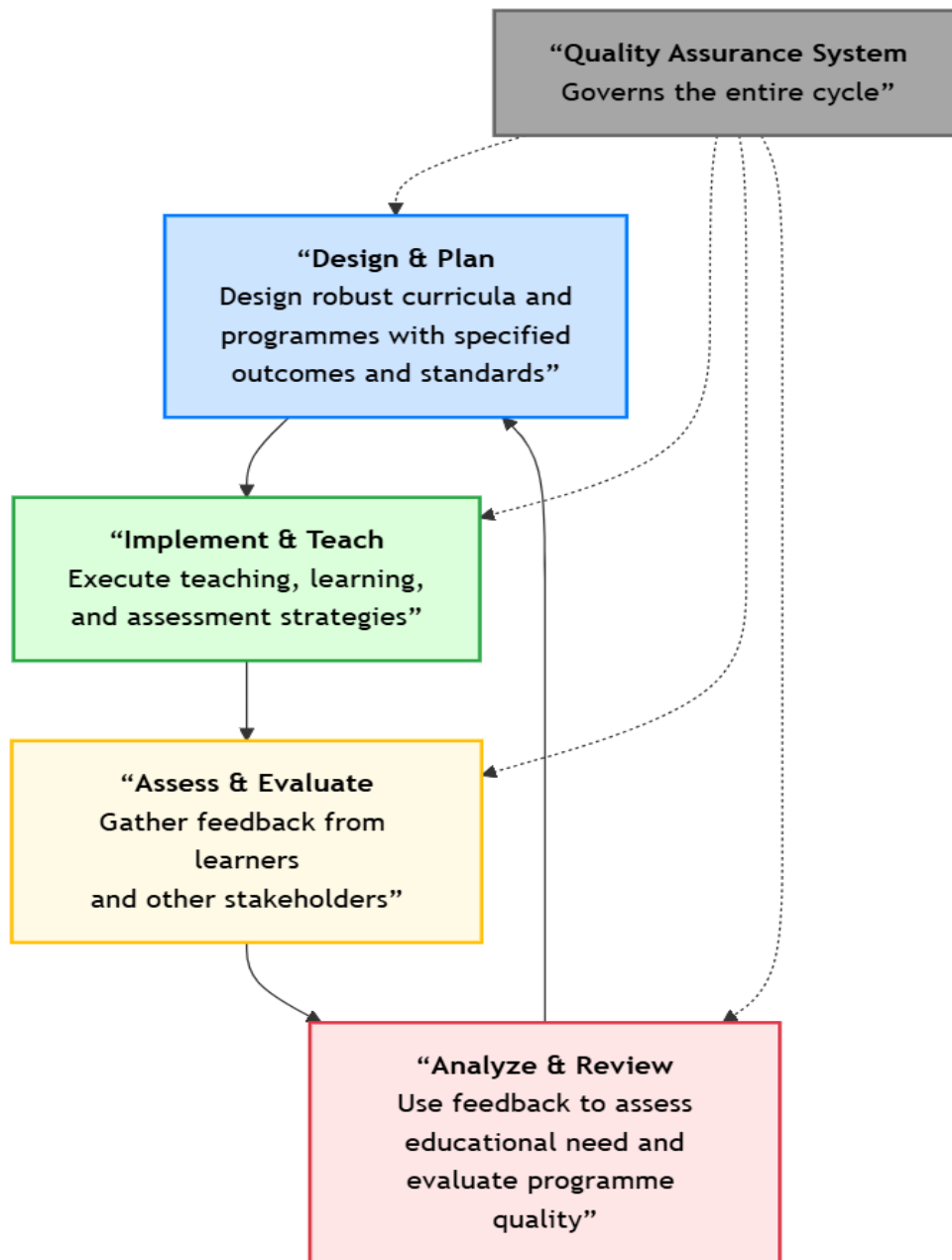


Fig.1. A Quality cycle

PART 2 - PROGRAM QUALITY ASSURANCE SYSTEM

A. Bi-annual Quality Assurance Auditing

1-Program Quality Assurance Committee

The Quality Assurance Committee conducts regular checks of document and service quality using approved forms, either semiannually or annually. These evaluate key documents, such as course reports, specifications, and annual program reports.

2- A. Faculty Quality Assurance Unit

The Quality Assurance Unit (QAU) in the Faculty of Science conducts biannual reviews to ensure programs meet standards by reviewing documents, requesting evidence, inspecting facilities, and meeting beneficiary quality.

Aim: To provide programs and committees with analysis for further recommendations, writing action plans, and addressing improvement issues.

B. Annual Internal Review (Internal audit report)

This annual review is more comprehensive than the twice-yearly Quality Assurance review in the College of Science's accreditation programs. The team includes the Vice-Dean and coordinators from accreditation, measurement, evaluation, and quality assurance. It reviews all quality documents and services, providing detailed reports with recommendations for program coordinators to develop improvement plans.

PROCEDURES OF ASSESSMENT AND EVALUATION

1-Define and review the Program's Mission and Objectives:

The Program's Mission and Objectives are reviewed every three years for development and improvement, in accordance with Department Council No. 12 for 1445H.

2-Periodic evaluation

-Measuring learning outcomes at each semester (PLOs report)

3-Mechanism of reviewing a graduate's attributes and program learning outcomes.

The graduate attributes and program outcomes are reviewed based on the program's mission, objectives, labour market needs, accreditation recommendations, and university recommendations, typically every 5 or 6 years. The review considers national and international standards and the National Qualifications Framework, in accordance with Dep Council no. 12 for 1445H.

4-Tools measuring graduates' attributes and the Program learning outcomes

Direct evaluation methods: written, practical tests, and rubrics

Indirect evaluation methods: graduates and employers' surveys

5-Mechanism of linking the Program learning outcomes to courses

The program learning outcomes are linked with the courses according to the following levels of performance:

| Introductory level | Practice level | Mastery level |
|--|--|---|
| The concept or skill (learning outcome) is presented for the first time or in a general way, possibly in a foundation/introductory course. | The concept or skill is intentionally built on or reinforced in a new context as students are given opportunities for practice | The concept or skill is sufficiently practiced, possibly in the senior-level courses, senior project or other capstone experience, and students can demonstrate mastery at a level appropriate to the course. |

6-Mechanism of determining teaching strategies and evaluation methods in the Program

The teaching strategies used in the program should align with the program learning outcomes (PLOs) and course learning outcomes (CLOs). The program also considers diversity, course-level suitability, skill development, critical thinking, and self-directed learning ([Teaching strategies guide- examination rules and evaluation methods](#)).

7-Mechanism and procedures of evaluating the field experience course and its periodic reports

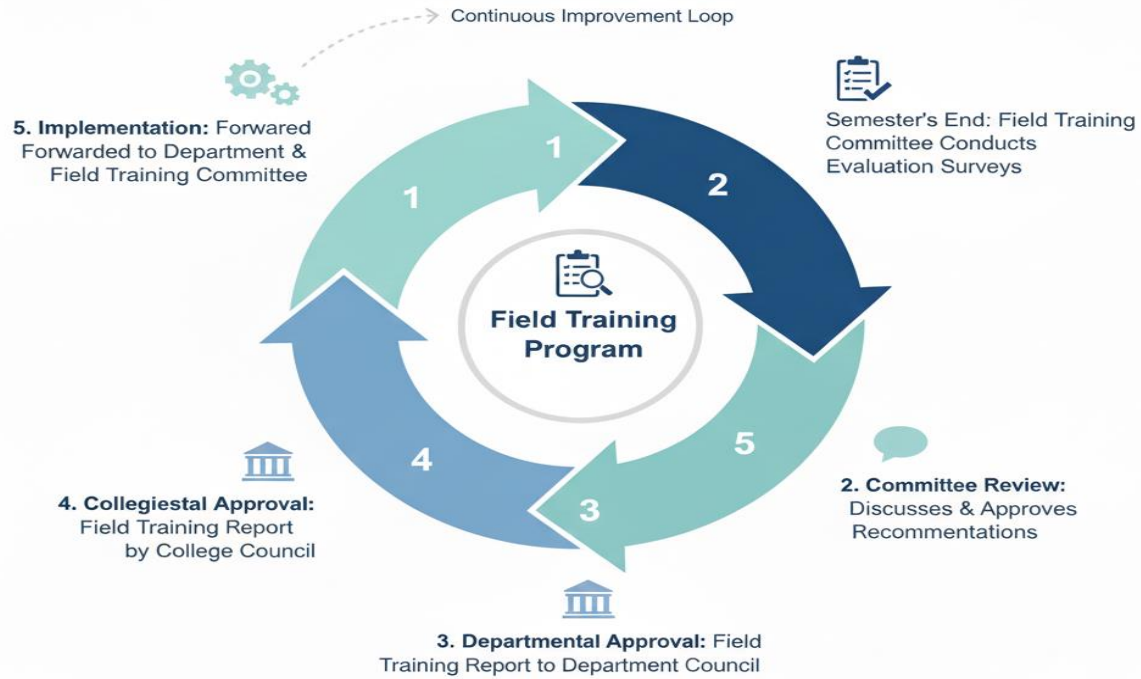
- Survey of students' opinions to evaluate the quality of the training program
- Establishing Controls for selecting and qualifications of the training staff
- Preparing an annual report on the field experience course using the models of the National Centre for Academic Accreditation and Evaluation
- Evaluating students' performance during the field training period.

-The program mechanism to follow up on the commitment of all participants in field training to the responsibilities and tasks stipulated in the field experience specification.

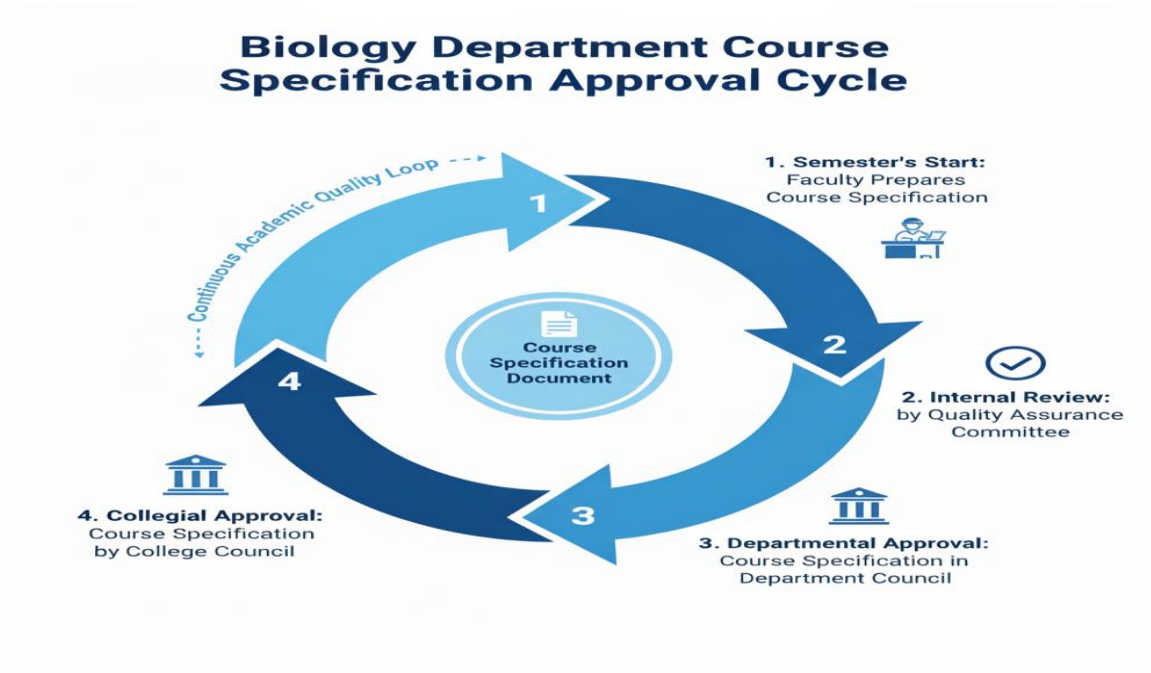
-Survey of students' opinions to measure the quality of supervision.

- Discussion of the annual report in the Department Council every semester.

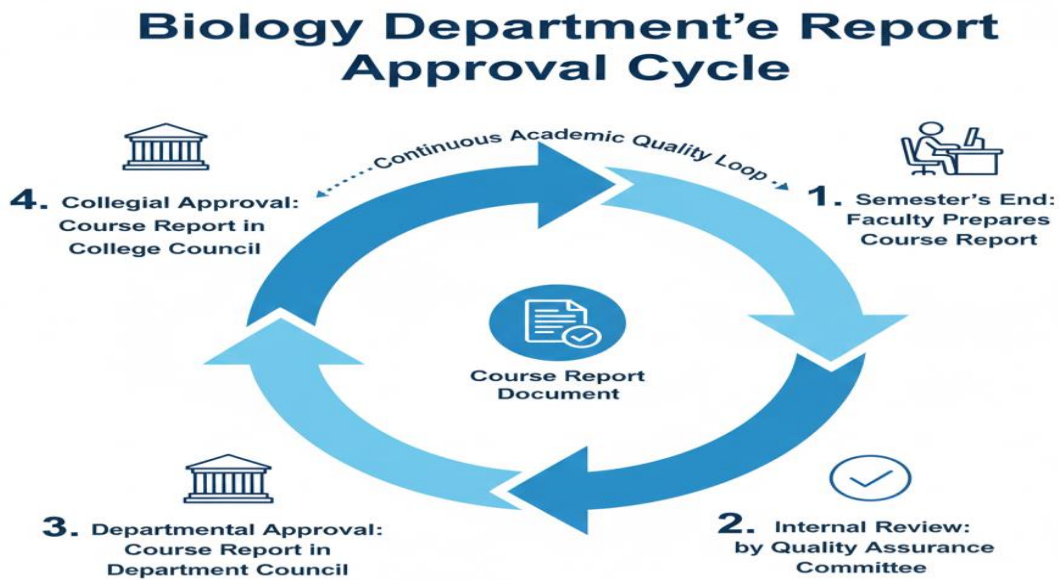
Biology Department - Professional Field Training Evaluation & Implementation Cycle



8- Course specification

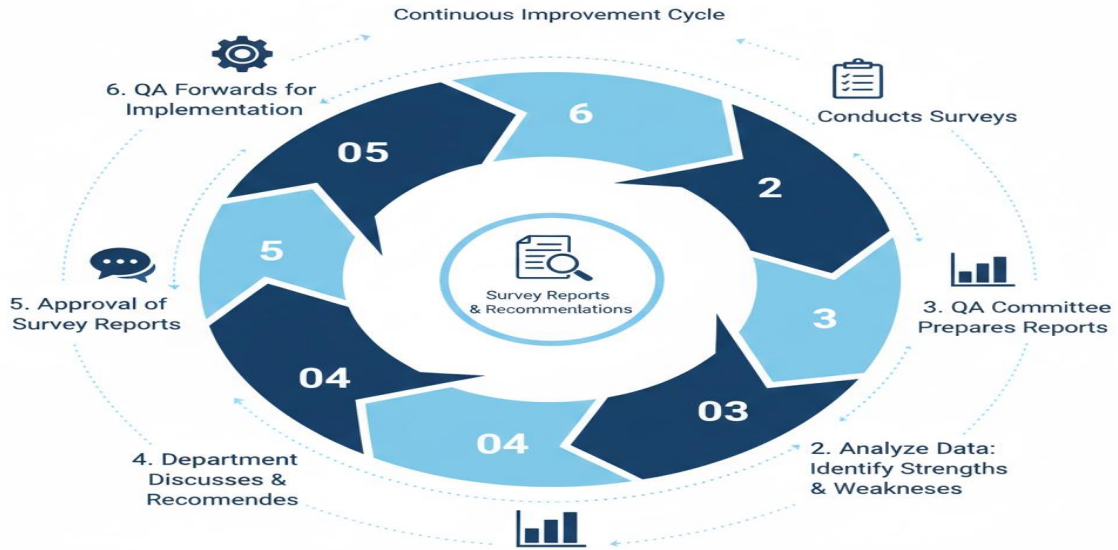


9- Course Report



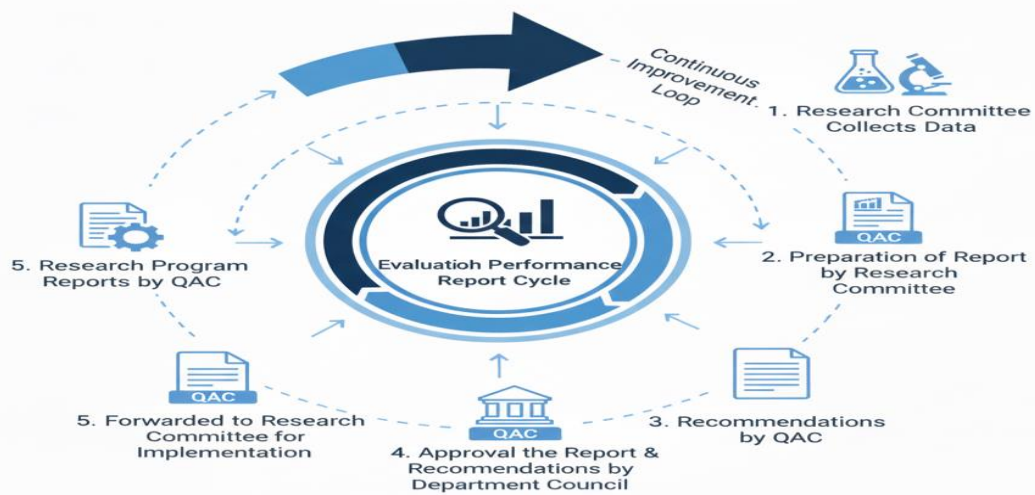
10-Surveys

Biology Department – Academic Survey Feedback Loop



11-Evaluation research activities

Biology Department - Evaluation of Research Activities

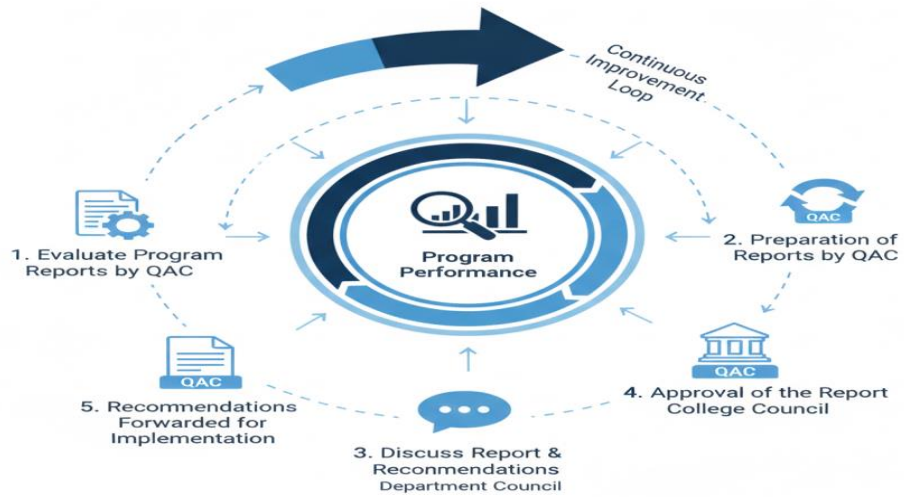


12-Program KPIs

| No. | Code | Key Performance Indicator (KPI) | Method | Timing | Responsible Committee |
|-----|-----------|--|--------|--------|-----------------------------|
| 1 | MU-P-01 | Beneficiary satisfaction with community services | Survey | Annual | Alumni & Community Services |
| 2 | KPI-P-01 | Student satisfaction: Learning experience & services | Survey | Annual | Academic Affairs |
| 3 | KPI-P-02 | Students' overall rating for course quality | Survey | Annual | Academic Affairs |
| 4 | KPI-P-03 | Completion rate (minimum time per cohort) | Data | Annual | Student Affairs |
| 5 | KPI-P-04 | First-year student retention rate | Data | Annual | Student Affairs |
| 6 | KPI-P-05 | Professional/National examination success rate | Data | Annual | Student Affairs |
| 7 | KPI-P-06a | Employment rate (within 12 months of graduation) | Survey | Annual | Alumni Affairs |
| 8 | KPI-P-06b | Postgraduate enrollment rate | Survey | Annual | Alumni Affairs |
| 9 | KPI-P-07 | Employer satisfaction with graduate proficiency | Survey | Annual | HR & Post Grad. Education |
| 10 | MU-P2 | % of students with academic warnings | Data | Annual | Student Affairs |
| 11 | MU-P3 | % of students denied entry to final exams | Data | Annual | Student Affairs |

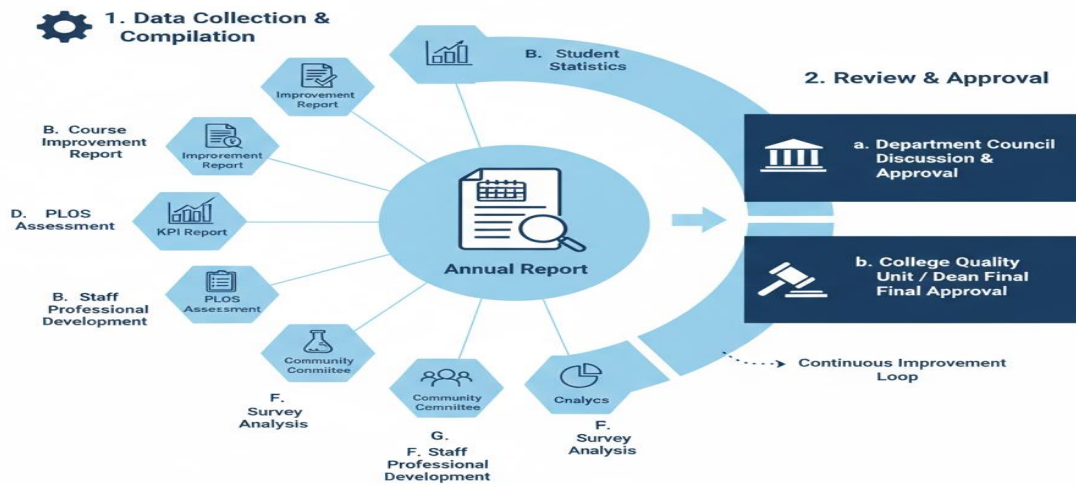
| | | | | | |
|-----------|-----------------|--|------|--------|-------------------------|
| 12 | MU-P4 | Number of student papers published/presented | Data | Annual | Scientific Research |
| 13 | KPI-P-08 | Student to full-time faculty ratio | Data | Annual | Quality & Accreditation |
| 14 | KPI-P-09 | % of faculty with at least one publication/year | Data | Annual | Scientific Research |
| 15 | KPI-P-10 | Average research publications per faculty member | Data | Annual | Scientific Research |
| 16 | KPI-P-11 | Average citations per faculty member | Data | Annual | Scientific Research |
| 17 | MU-P-05 | % of faculty providing professional development | Data | Annual | Scientific Research |

Biology Department - Program Performance Improvement Cycle

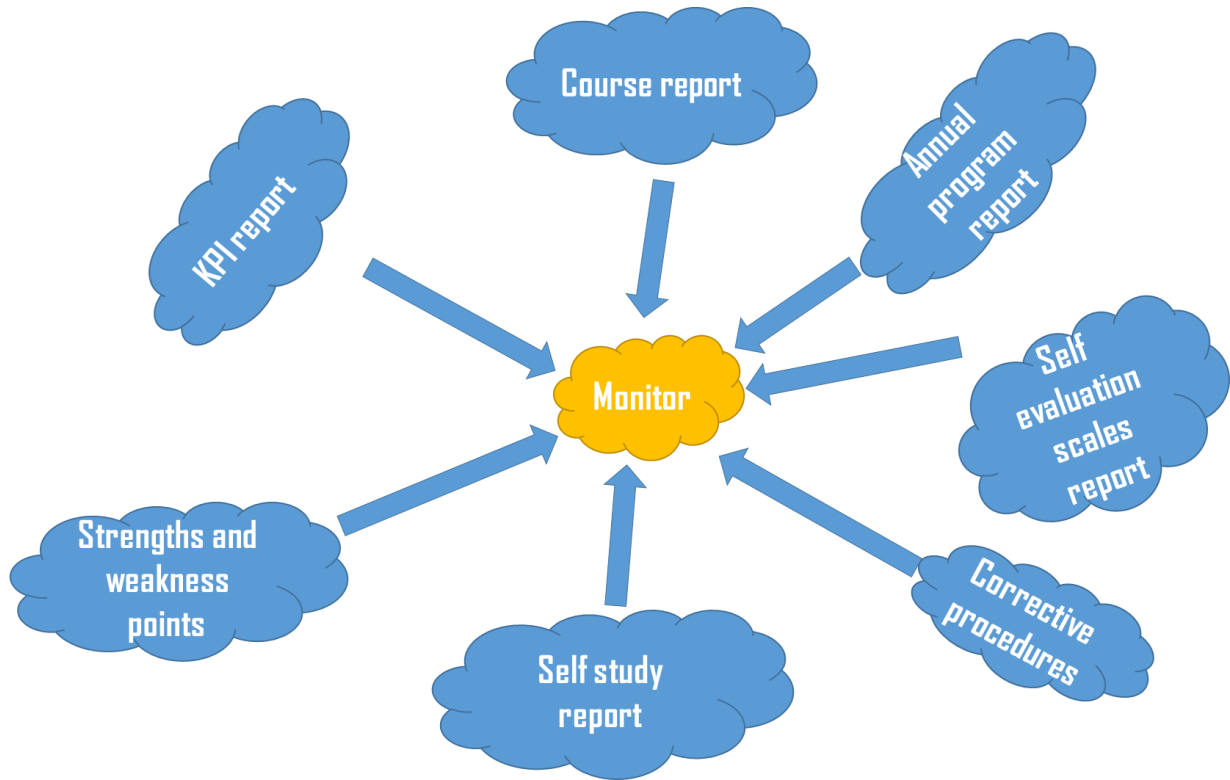


13. Program Annual Report

Biology Department - Annual Report Generation & Approval Cycle



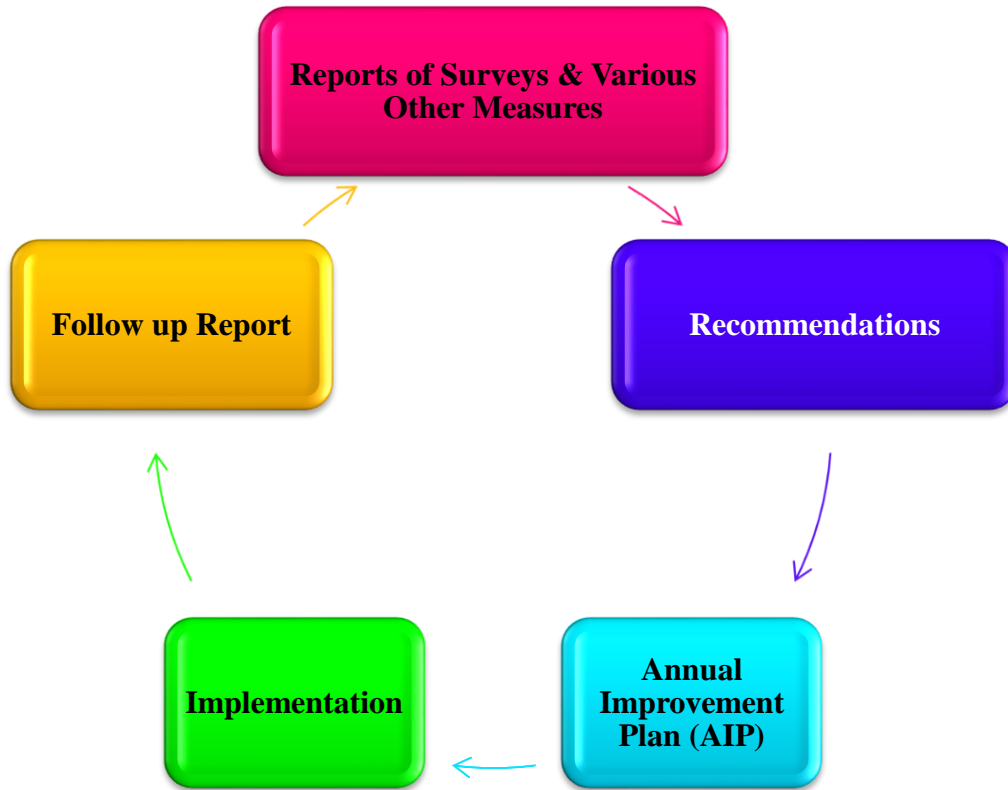
14-Ensuring the adequacy of Learning processes & Resources



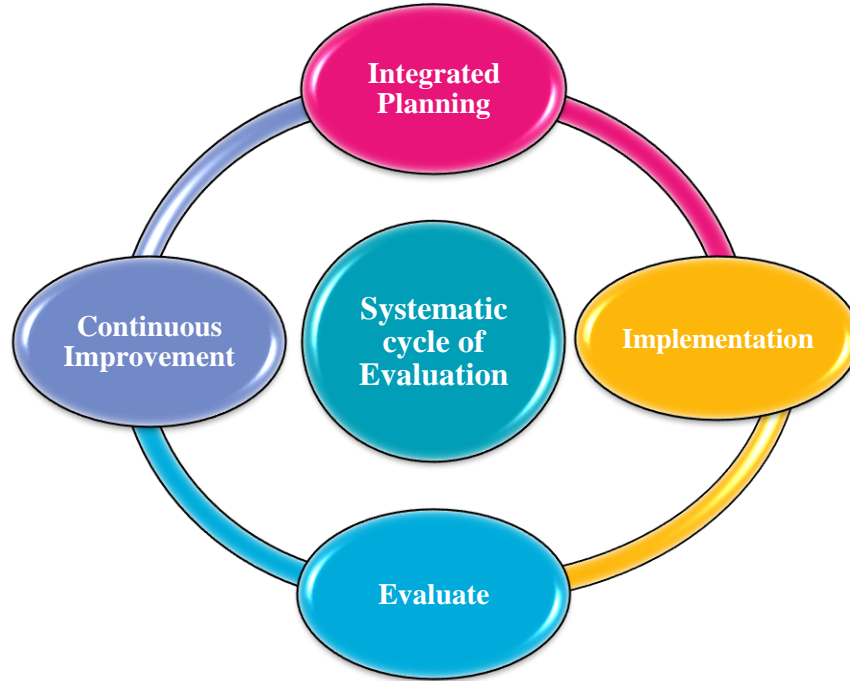
15-Program Plan to achieve the Mission & Objectives



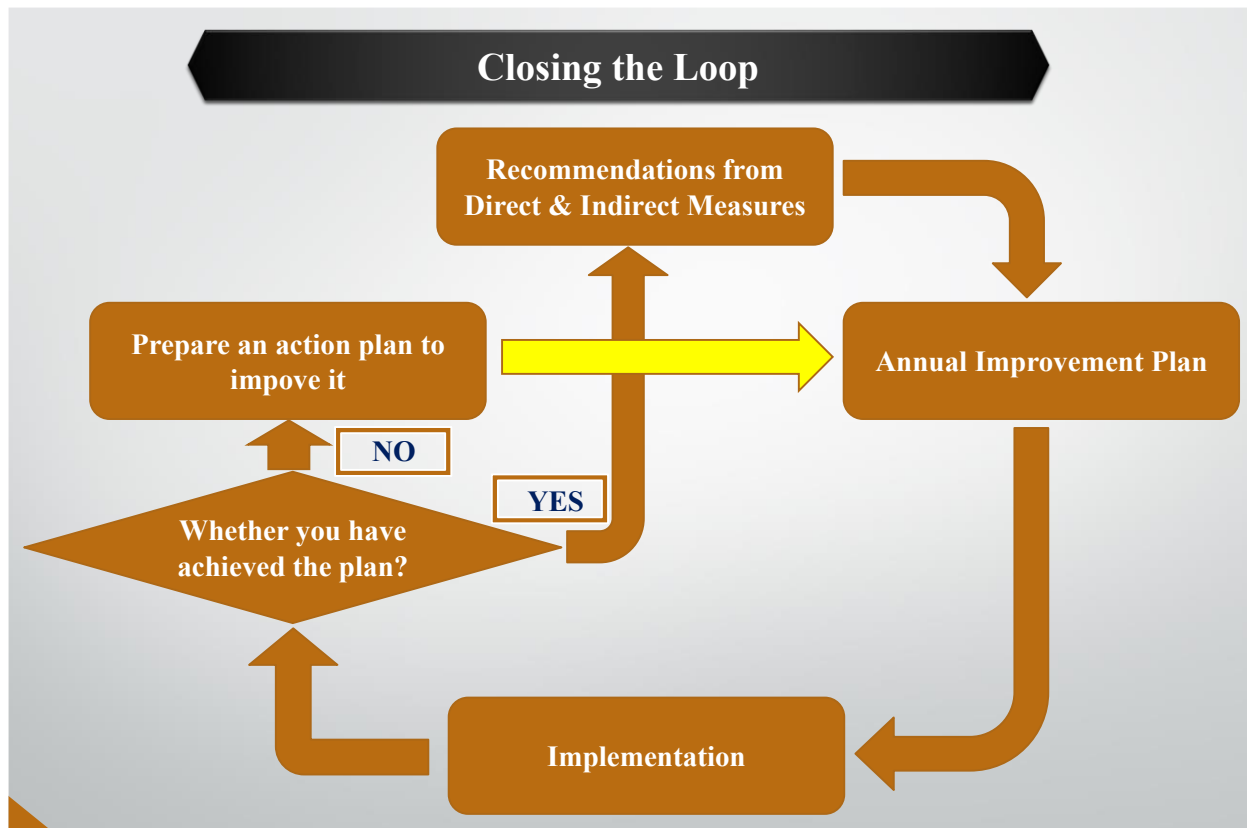
Program Evaluation Process



Systematic Cycle of Evaluation



Process of Closing the Loop



Mapping Matrix of the Indirect Measures

| S. No | Methods of Assessment | Mapping Matrix based on desired level of performance. (I=Introduced, P=Practiced, M=Mastered) |
|-------|-------------------------------------|---|
| 1 | Student Experience Survey (SES) | I |
| 2 | Course Evaluation Survey (CES) | I |
| 3 | Academic Advising Survey (AAS) | I |
| 4 | Survey on Community Services (SCS) | I |
| 5 | Program Evaluation Survey (PES) | P |
| 6 | Scientific Supervision Survey (SSS) | P |
| 7 | Faculty Satisfaction Survey (FSS) | P |
| 8 | Advisory Committee feedback | P |
| 9 | Student overall GPA | P |
| 10 | Quality Assurance Audits | P |
| 11 | Graduate / Alumni Survey (AS) | M |
| 12 | Graduate Stakeholder's Survey (GSS) | M |
| 13 | Vision Mission Survey (VMS) | M |
| 14 | Internal reviews | M |

Linking the Program Quality System to the Institution (College of Science)

